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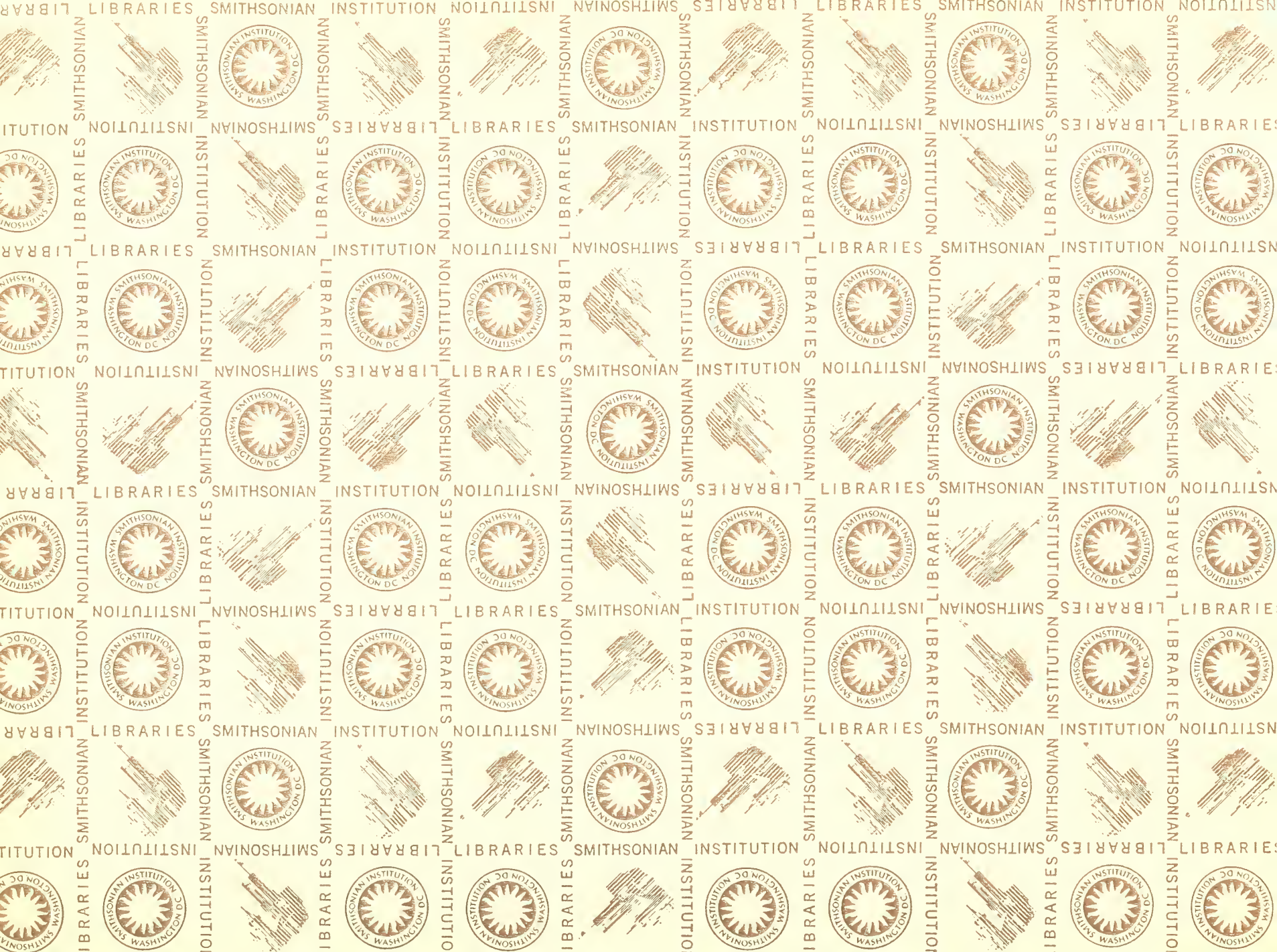
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THE AEROPLANE

1D WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

Vol. II.] [REGISTERED AT THE G.P.O. AS A NEWSPAPER.] THURSDAY, JANUARY 4th, 1912. No. 31

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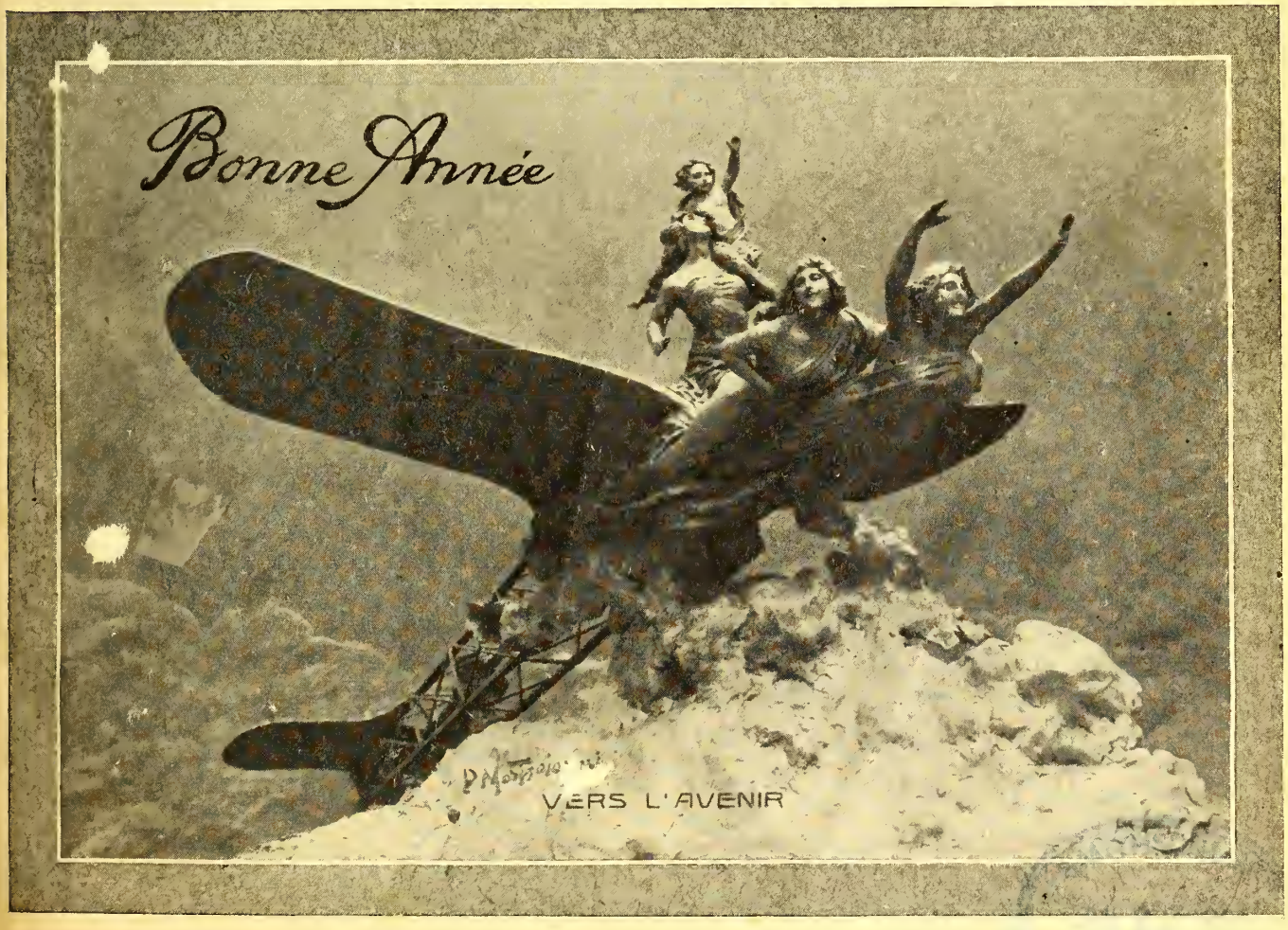
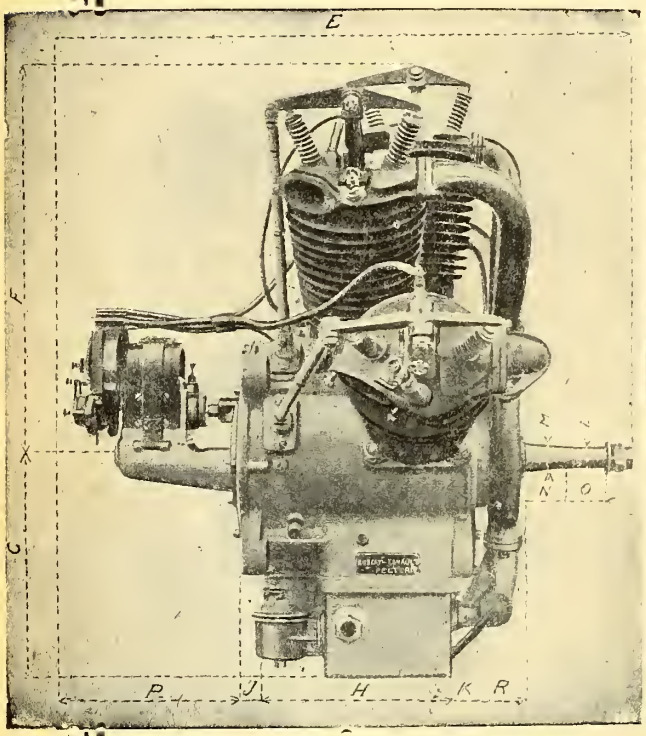
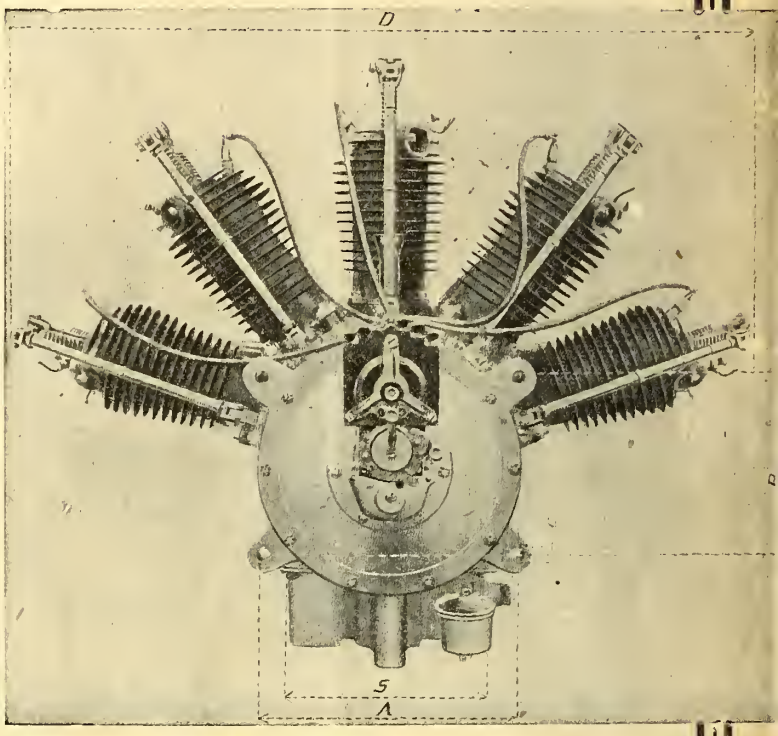
A PROSPEROUS NEW YEAR TO ALL.



TOWARDS THE FUTURE:—A fine piece of modelling in "alto relievo," which is very popular in Paris as a New Year card. It expresses excellently the hopeful spirit in which the French view aviation.

VICKERS R.E.P. AVIATION MOTORS.





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40/50	240 lbs.	4″	5·5″	£480	5
60	330 lbs.	4·4″	6·4″	£560	5

Gibert, flying in the Circuit of Europe, using this engine, completed the whole course without changing his motor.

APPROXIMATE DIMENSIONS.

SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T
50 H.P.	11·4″	8·25″	·71″	38·8″	30·6″	20″	11″	9·25″	1·38″	1·18″	1·18″	1·57″	1·93″	2 67″	10·9″	·39″	2·68″	9·84″	·83″
60 H.P.	14·15″	10·25″	·79″	47·2″	33·4″	24·6″	12·4″	10″	1·32″	·98″	1·34″	1·73″	2·56″	2·36″	11·3″	·39″	3·62″	13 8″	·91″

SPECIFICATION OF ENGINES.

5 Cylinders, Air-cooled, Fitted with Bosch Dual Ignition. Self Starting on Accumulators. Develop H.P. advertised at 1,200 Revs. per min. (normal speed). Can be throttled to run at 400 Revs.

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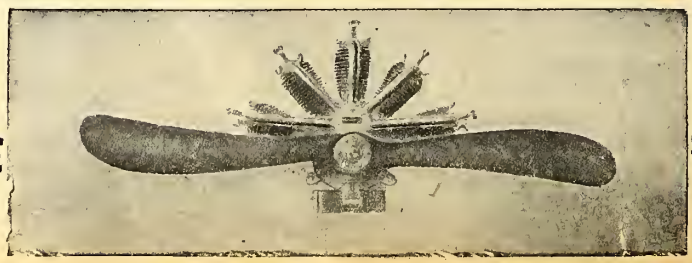

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The Prevention of Future Accidents.

By a peculiar coincidence two important communications have been received during the past week on the same subject from two of our best known and most capable aeroplane designers, Mr. W. O. Manning and Mr. Howard Flanders. The writer happens to know that for some time both these gentlemen have been studying seriously the causes of various accidents, and it appears that they have both come to the same conclusion, namely, that in order to diminish the number of accidents in the future it is necessary to appoint some sort of committee to deal with the matter. Their ideas on the subject are embodied in the following letters.

Mr. Manning writes :—

"It seems to me that the time has now come when the question of serious accidents to aeroplanes might be adequately dealt with by one of the governing bodies of the new science. I am aware that an attempt has already been made to officially supervise the construction of machines, but this method is open to the objection of hampering the ideas of the designer, or possibly imposing on designers the peculiar ideas of a member of the committee undertaking these duties, and also of the difficulty there would be of finding trained men qualified to perform these duties.

"I have an alternative method to suggest :—

"(1) That a committee should be formed of several specially qualified men, under the auspices of either the Royal Aero Club, the Aeronautical Society, or the two in combination.

"(2) That in the case of the death of an aviator or his passenger in an aviation accident, it should be the duty of one or two members of this committee to examine the debris to obtain as much information as possible, from eye-witnesses and others, and to draw up a report on the subject for the information of the Royal Aero Club and the Aeronautical Society, not necessarily for publication.

"(3) That the members of this committee may, if necessary, offer themselves as witnesses at the inquest, thereby enabling them to explain the details of the accident without fear of the law of libel.

"(4) That, if possible, one of the members should, if invited, act as technical adviser to the coroner.

"I would like to point out a few of the advantages of this scheme :

"First, it would protect the conscientious manufacturer from the consequences of a death on one of his machines caused by the incapacity or the carelessness of the pilot, as the report would presumably indicate where the blame is due.

"Second, it would visit the shoddy manufacturer with the heavy penalty of publicity, and would warn the intending purchasers of the machine of the fate which probably awaits them.

"Third, it might subject those manufacturers to the penalties attaching to the crime of manslaughter, which everybody must agree would be richly their due.

"Fourth, it might call attention to unusual stresses which may act on aeroplane structures, and it would form an invaluable record of causes of accidents which could not fail to be of the utmost interest to everybody.

"Not being a lawyer, I am not aware whether the procedure of inquests permits of the application of Rule 4. If not, this rule could not, of course, be carried out.

"I should very much value your readers' views on the above."

Mr. Flanders says :—

"Aviation is now passing into a new phase, and it is necessary to be prepared for the events which will probably happen.

"Until recently the chief aim of the designer has been to make the aeroplane fly at any cost, and this has often been hard enough, largely owing to the fact that the engines we have had to use have been unsuitable.

"Now, however, we have moderately suitable engines at our disposal, and have to consider the question of long flights under adverse circumstances.

"In the prehistoric days when Blériot crossed the Channel, many amateurs of a mechanical turn of mind, seeing that Blériot's monoplane was made of simple materials which are easy to work, commenced to build aeroplanes, and many machines have been built and tried with engines which were unsuitable, and in consequence these machines did not fly. But now there are plenty of moderately satisfactory engines obtainable second-hand at a low figure, and these are being put into the same old machines, which will undoubtedly, and unfortunately, fly.

"Herein is a great danger, for many of these machines have been built by men having little or no knowledge of strengths and stresses, or even of correct balance, and it is almost certain that such machines will collapse in the air, or fail from lack of balance when tested. This is a serious matter, and will involve, in all probability, considerable loss of life.

"One regrettable feature of this question is that many pilots have no knowledge of the stresses on the various parts of the machines which they fly, and possibly may be tempted to experiment with these unsafe machines.

"There seems to be a general idea that because a man has paid £100 or so to learn to fly that he is competent to judge the strength and suitability of any aeroplane. I fear that many of those who learn to fly become mere '*cloche* stirrers,' who have learnt just enough to fly several figures of eight and make two landings without breaking anything.

"But how far is such a pilot qualified to say whether the structure he is asked to fly is strong enough to do the work which may be asked of it? How far is he qualified to know whether the machine has sufficient stability to be manageable in even a moderate breeze? Moreover, such a machine would probably be tried on a ground far less suitable than the aerodrome on which the pilot learnt, and even in the first flight the pilot may have to make a sharp turn or sudden rise, and the machine, if it has insufficient stability to withstand the sudden movement of the controls, will probably dive or turn over, and cause a serious accident.

"There are many machines, both British and foreign, which have the factor of safety of the stays to the rear spar much lower than those to the main spar. In most of the planes which are made on the usual lines the stress on the rear spar is from $\frac{1}{2}$ to equal to that on the main spar, yet in many makes, even in those of repute, the strength of the stays to the rear spar is $\frac{1}{4}$ (or less) that of the main stays.

"Also, the provision at the fuselage for the compression in the rear spars is rarely sufficient.

"All these things were comparatively unimportant when aeroplanes flew at low altitudes and in calm air; and furthermore, owing to the frequency of smashes, it was unnecessary to consider fatigue of the various parts. Now, however, the aeroplane is rapidly becoming a serious conveyance capable of long and continuous work, and either the construction of some machines must be improved or else we shall have an appalling death-rate.

"On the 18th ult., Major-General Ruck, C.B., urged the formation of a joint committee of inquiry. I trust that this may be formed, and that it will act vigorously and fearlessly, and will formulate some rules for the strength of vital parts.

"In my opinion, every constructor ought to show his drawings and dimensions to a competent authority, and unless the strengths are considered to conform with the rules, then the machine should be barred, and no certificated pilot be allowed to fly it under the penalty of suspension.

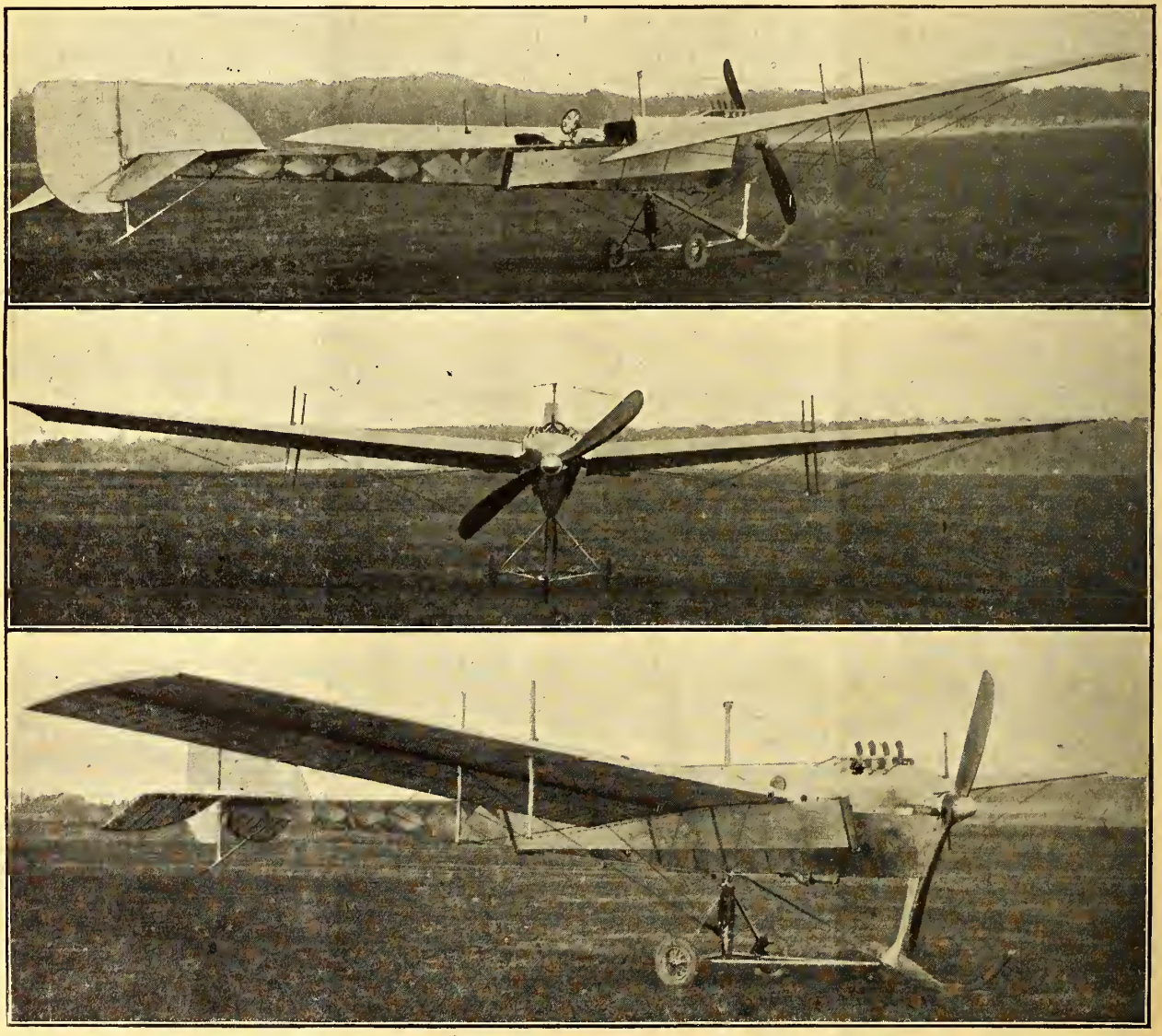
"Of course, such rules would not form a complete safeguard, as they would not take into account the workmanship, but they would save several of the accidents which have occurred. If such a committee is not formed, will it not be necessary for the Board of Trade to take the matter up?"

For some considerable time the present writer has done his best, in every publication in which he has been allowed space to express his ideas, to point out to the public that aviation is not in itself a dangerous occupation if only those who fly will use common sense, and will avoid obviously unsafe machines.

Happily one of the things responsible for a very great number of accidents—the engine-behind, lifting-tail box-kite—is steadily becoming extinct; but thanks to the increasing ease with which men learn to fly after a fashion, and, as Mr. Flanders points out, owing to the fact that almost anything can be made to fly with a modern engine, fresh elements of danger keep on cropping up. It therefore seems that the time has come when a committee should be formed to investigate the causes of any serious accidents which may occur in the future.

The idea is not a new one, but now the Government is beginning to take aviation seriously, in spite of the fact that even so enlightened a minister as Colonel Seely obviously remains under the impression that flying is necessarily dangerous, and that an aeroplane is inherently an unstable apparatus, and now that aviation as a sport is being brought within the means of any well-to-do man, it is time that a concerted movement was made to convince people that nine aeroplane accidents out of ten are absolutely avoidable.

A properly appointed committee would carry considerable weight, and their reports to the Press would be treated as worthy of wide publicity. Such pub-



The "Magnificent Martinsyde, as the new Martin-Handasyde Monoplane has been nick-named, fully justifies its title both in appearance and powers. Messrs. Sopwith, Gilmour, and Bell, who have all done good work on it, unite in declaring it a perfect machine from the pilot's point of view; and even rival constructors admit its excellent workmanship.

licity would go far towards removing popular illusions, such as the all-pervading one that if an engine stops the aeroplane falls to the ground, and that aeroplanes should be fitted with some sort of parachute arrangement in readiness for such a catastrophe, happily oblivious of the fact that a properly designed aeroplane is a much better parachute than anything of the umbrella shape, in that it descends more slowly and is under perfect control all the time, which an ordinary parachute is not.

The Material Available.

Of course, the great difficulty before any society or club, or even the Government itself, is the finding of suitable individuals to form such a committee of investigation. Having a fairly intimate personal acquaintance with everyone in this country with any claim to be considered as possessing sufficient knowledge of the theory and practice of aeroplane construction and flying to be worthy of a place on such a committee, the writer does not hesitate to say that the only men whose opinions would be of any real value are, in one way or another, connected with business firms engaged in the building of aeroplanes.

Though personally quite a number of them are of unimpeachable honesty, they would scarcely be considered fit and proper persons to form a jury on a rival maker's machine, and, even if they were, their intense personal honesty would undoubtedly increase rather than diminish the severity of their verdict against any machine which did not confirm to their own convinced ideas of what an aeroplane should be.

Outside of actual constructors the only other people likely to be of any use on such a committee would be either aviators or members of the Committee of the Royal Aero Club and of the Council of the Aeronautical Society.

So far as the aviators are concerned, here again one is confronted by the fact that nearly all the best men have more or less interest in the trade, and of the rest a dangerously large number belong to the class aptly described by Mr. Flanders as "*cloche* stirrers"—men whose only idea of flying is to get into a machine and stir the control lever hither and thither without in the least realising why they do so beyond the fact that a brief experience with a "brevêt crammer" has shown them that certain results probably follow certain movements. And even the best flyers of the few unconnected with the trade have unconscious prejudices in favour of certain types of machines, certain methods of control, and certain details of construction, and would regard anything not conforming to those prejudices as being dangerous.

There remains then the non-trade and non-flying members of the Committee of the Royal Aero Club and of the Council of the Aeronautical Society, who on account of their official positions would doubtless carry most weight with the Press and the public. Unfortunately no practical flyer or constructor would submit to their jurisdiction for a moment, nor would their opinions be regarded as of any value by practical men. Therefore they may be ruled out at once. In fact, it would seem that only a committee of archangels could be above reproach, for they alone would be at once above suspicion and, at the same time, undisputed authorities on aviation.

The Possible Solutions.

The only practical solution of the difficulty seems to be the choice of one of two courses.

One is the appointment of a joint committee of constructors and aviators elected by the *whole membership* of the Royal Aero Club and Aeronautical Society. This committee should on no account be appointed by the existing Committee and Council respectively of these bodies, for already there has been too much "jobbing" of unsuitable and incompetent people on to sub-committees of both these bodies, whereas if the all-round knowledge and common sense of the unofficial member were called upon things would be very much better managed.

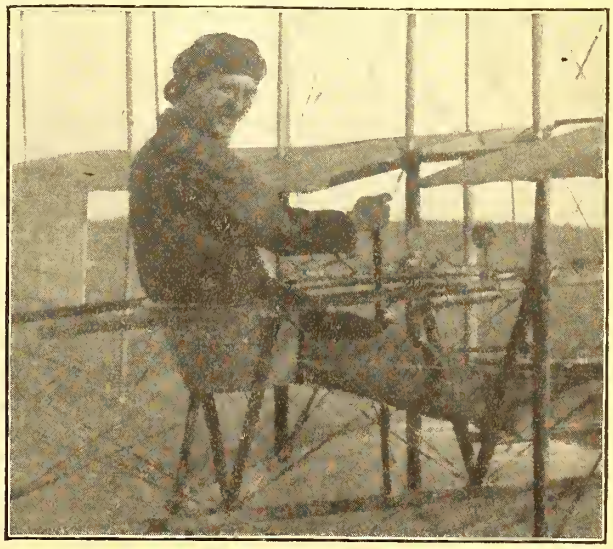
The other course is the appointment by the Board of Trade of an official whose duties would be very similar to those now so ably fulfilled by Colonel Von Donop, when inquiries are held concerning the causes of railway accidents.

In either case, whether the inquiry was held by a committee or by an individual, all available evidence would have to be collected and sifted, and a report published, the said report to be as free as possible from mere expressions of opinion, and to be confined as closely as might be to plain statements of facts.

Mr. Flanders' proposition that designs should be submitted to a committee for approval is, it is to be feared, quite impracticable, for such a committee could only consist of practical designers, and the members could hardly be expected to approve of many of the revolutionary ideas which would certainly be submitted to them, although these ideas might ultimately prove to be quite sound. And, further, the constitution of such a committee would be even more difficult than that of a committee whose sole duty it would be to hold inquiries as to the causes of accidents.

Certainly there is great danger in store for pilots who may be tempted to fly dangerous machines, but, after all, that is the pilot's affair, and the most we can hope for is that something may be done to explain regularly to the public that nearly all accidents are avoidable, and that flying under proper conditions is not dangerous, while at the same time the causes of accidents may be so fully investigated and made known as to minimise their frequency.

The opinions of all readers of The Aeroplane, especially those of practical men, such as constructors and pilots, are earnestly requested on this vital subject.



The late Hubert Oxley, the last victim of an avoidable accident. He is here shown on the Avro on which he did his first flying.

Local Patriotism.

In spite of the fact that France already possesses, or has on order, something over 200 war-planes, the French press and the French people are by no means satisfied with that number, nor with the Government programme for next year, for the bulk of the money voted for aerial defence in 1912 will be absorbed in paying for machines ordered in 1911, and it is thoroughly well realised that Germany already possesses nearly as many war-planes as does France. Consequently, an agitation has been started, headed by M. Henri Desgranges of *L'Auto,* in favour of adding to the number by means of subscriptions raised in the various departments of France.

M. Desgranges's idea is that each department or each great town should buy one or more aeroplanes, or *avions,* as the French war-planes are officially called, and that these machines should be presented to the Army, each machine being known by the name of the place or district which presented it. General Roques, the chief of the French war-plane establishment, has accepted the idea with enthusiasm, and it is highly probable that before long France will have almost as many machines as she really needs for the present.

Wanted—British Energy.

Despite Colonel Seely's efforts, supported as he is by the more intelligent members of the General Staff of the War Office, there is evidently going to be some difficulty in persuading the reactionaries to buy machines in sufficient quantities to give our Air Battalion a fair chance. Consequently, it would be an excellent thing if a similar scheme could be worked in this country.

Already the Liverpool Navy League has made an attempt to raise enough money to buy a machine for the Navy, but it is to be feared that little success is being achieved as yet. Nevertheless, if only some of the really influential people in each of our big cities would get together, use their influence with the local press, and get a good pilot to do a little imitation bomb-dropping over the city just to show people what can be done, it ought to be possible to raise £1,000 at least.

Surely there are at least twenty or thirty towns in Great Britain which could each raise £1,000 with which to present an aeroplane and a full equipment of spare parts to the Army.

When a battleship is christened after a county there does not seem to be much difficulty in raising the money in the county to present it with a service of purely ornamental plate, and the same sum should be just as easy to raise in order to buy a really useful weapon for the nation.

Some Suggestions.

If the Aerial League had any real energy or influence, this is a matter it ought to be able to take up and carry through successfully. As it is, perhaps, the National Service League can be persuaded to act.

Or—excellent idea—will some of our M.P.s who scorn to accept their £400 per annum from the State join their paltry stipends together and make the State pay for its own aeroplanes out of its own pocket? Any two M.P.'s could in this way provide a thoroughly up-to-date war-plane, and even one by himself could, with his £400, present to the Army a really excellent single-seater capable of flying for a couple of hours at a stretch, and just the very thing for the training of young officer-aviators.

What Does It Mean?

The following startling announcement appeared in *The Standard* on Tuesday last:—

"The Director of Personal Services at the War Office is inquiring through the General Officers of Commands if there are any captains or subalterns of the Royal Engineers who would like to serve with the Air Battalion R.E., for work with (*a*) captive balloons and kites, (*b*) airships, (*c*) aeroplanes. The wishes of officers desirous of undertaking any particular branch of air-work are to be met so far as possible, but there are, however, but few vacancies as aeroplane pilots.

"Officers taking up captive work will also have the opportunity of learning the management of airships, but no promise will be made that they will be transferred to the Aeroplane Company. The possession of a pilot's certificate is not necessary."

Unfortunately, The Aeroplane was going to press when this announcement appeared, and there was no time to inquire further into the matter. However, on the face of it, two things are apparent. One is that the War Office is determined to fill the Air Battalion with Sappers, and the other is that while there are thousands of officers anxious to join the Aeroplane Company, no one is keen on wasting their time on balloons, dirigible or otherwise. The matter demands immediate attention from all those who have the good of the Air Battalion at heart.

The Aircraft Factory's Latest.

The following is from *The Times* of January 2nd:—

"Remarkable flights took place yesterday morning at Farnborough of a new and perfectly silent aeroplane which has been produced by the Aircraft Factory from the remains of a Voisin machine presented by the Duke of Westminster. Two flights of about fifteen miles each were made, one with and one without a passenger. The smoke of the factory was blowing horizontally while the machine was out, but it flew with absolute steadiness."

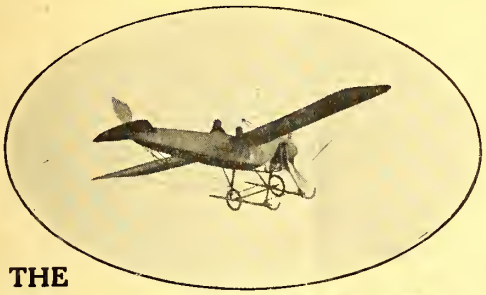
Apart from the grammar of the first sentence and the haziness of the last, which makes it doubtful whether it was the factory or the smoke, or the machine which "flew with absolute steadiness," and does not explain why the factory was smoking—smoking being prohibited near balloons, as a rule—it may be well to explain that so far as one can gather, the machine in question is an attempt to copy and combine the Avro and the Bréguet, and that a "perfectly silent aeroplane" was made by Mr. Manning and Mr. Howard Wright two years ago.

Latham Goes Abroad.

M. Hubert Latham sailed on Saturday from Bordeaux for the French Congo on a big-game shooting expedition. He is also acting on behalf of the Minister for Colonial Affairs in a matter which is not disclosed, and is taking a monoplane, presumably an Antoinette, with him.

Mr. T. O. M. Sopwith, with a passenger, cornering on the magnificent Martin-Handasyde monoplane

Over 60 m.p.h. carrying passenger.



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STOCK DIRIGIBLES

"City of Cardiff" Type, to carry 4, £900 complete.
New Light 2-Passenger Model - - £370 „

4—32c VILLA ROAD, HANDSWORTH, BIRMINGHAM

AIR CURRENTS.

A Really Businesslike Competition.

Government competitions being, so to speak, current just now, we make no excuse for publishing particulars of the scheme proposed by the Government of Gamagia. We understand that the Government is strictly a *Business Government.* The conditions are in the form of a general Proclamation, and are briefly as follows:—

Prizes.—First prize, £500,000. Consolation prizes of boxes of cigars will be given to all unsuccessful competitors.

Competitors.—Anyone with an aeroplane.

Conditions.—Entrance fee, £50 (no reasonable offer refused).

Competitors must at once take out, and pay for, a State Insurance Policy.

Free petrol and refreshments will be supplied to pilots. (Competitors must bring their own hangars.)

Competitions.—The competitions will extend over ten consecutive days, beginning with the first fine day.

1st Day.—Private view. Members of the Cabinet will examine machines and cross-examine pilots. Competitors must file affidavits that their machines are flying machines, and must be prepared with documentary evidence to prove that they are (*a*) aeroplanes, (*b*) not dirigibles. Marks will be given for civility. Free flights must be given to Cabinet Ministers and friends.

2nd Day.—General public view. Admission 6d.; reserved paddock 1s.; to hangars 5s. (Apply early.)

3rd Day.—Speed competition. The fastest machine will be adjudged the swiftest. In connection with this a Grand National Air Sweepstakes will be held. (Tickets 6d.).

4th Day.—Passenger carrying tests. Machine carrying most passengers in day to be adjudged winner. (Tickets for flights obtainable on ground. Children under twelve half-price. Special terms for families.)

5th Day.—Field ploughing competition. All competitors to plough at least one field of Crown land, and get off as cheaply as they can.

6th Day.—Bomb-dropping tests. Bombs to be in form of postal bags containing aerial postcards (6d. each, five for 2s., at all big stores). It is to be supposed that an attacking force has set out to destroy all post offices (sorting offices for preference). Machine dropping greatest number of bags to be adjudged winner. Any machine dropping itself with bags on board to be disqualified.

7th Day.—Duration tests. All machines will be lined up, and at word of command ascend, machine keeping up longest to be adjudged winner. (The State bookmakers will be on the ground. Cinematograph rights for sale.)

8th Day.—Grand parade and field day under supervision of Commander-in-Chief, and patronised by the leading musical comedy stars. Competitors will give exhibition of military manœuvres and sham fighting. After sunset grand aerial fireworks, illustrating destruction of Sodom and Gomorrah and other events. Be in time! Admission 5s. (Society Day).

9th Day.—Eliminating contest (if necessary). Competitors will be required to "loop the loop," "whirl the whirl," fly backwards, fly upside down, change propellers with other machines while in the air, ditto engines and landing chassis, mend tyre punctures during flight, etc., etc.

The final heat will consist of an assembling test. All component parts of machines to be unscrewed, unglued, unriveted, taken apart, disjointed, or otherwise severed and sundered, and mixed up thoroughly in centre of aerodrome. The machine first assembled to be adjudged winner. (Should disputes arise or no machine be entirely assembled a jumble sale will be held to defray expenses.)

Experiments in towing against the wind the Army dirigibles *Meter* and *Ergaer* will also be invited.

Admission: Gamagian subjects, 13s. 4d.; all foreigners free.

10th Day.—Prize distribution and banquet, when Prime Minister will hand Government I.O.U. for first prize to owner of most consistently successful machine (his heirs and executors), and will issue extensive orders for machines to all firms competing, subject to a deposit of £1,000 from each firm. (Admission, by ticket only, 10s. 6d., without wine. State vintages compulsory.)

Note.—Excursions at Special Fares will be run by the State Railways to the flying ground from all parts.

Frank A. Gibson.

On a Sunny Day in June.

The garden was uninhabited. At least I thought so at first, but a closer inspection revealed the next-door cat and a model aeroplane. My mind could form no dangerous connection between the two, since I knew the cat to be a respectable mother of a family, who would have no intention of aviating, so I left them to their own devices.

I fixed the deck chair in the lowest notch, opened the latest production from the lending library, and proceeded to make myself happy. I read a couple of pages. As far as I can remember, they consisted of a vivid description of a creeper-covered cottage and a fair lady, who, like most of the heroines I had encountered lately, was in love with an aviator. After the first half of the third page the descriptions got so hopelessly mixed that I abandoned the attempt.

* * * * *

Crash!!

I awoke from a wild dream of flying the Atlantic on a step-ladder, which had suddenly evinced a desire to plunge down a funnel of the *Lusitania,* which we had overtaken *en route.*

I sat up with a start. I was not in the engine-room of the *Lusitania,* or on the step-ladder either.

Of course, just my luck. I *should* choose the one rocky deck chair out of a possible three.

I picked up my bruised self and my offended dignity as best I could, and chose a cushion and a rug as safer substitutes.

I took up the book and tried again. No, on second thoughts, no, it was far too hot to read, it was far too hot to think, it was too hot to——

* * * * *

Confound!!

I woke up for the second time. What the Dickens?

The model aeroplane had apparently made a neat *vol plané* on to the middle of my underneath. After all, perhaps the cat—but a second glance revealed the Small Boy of the house.

"Come on," said he, gaily, "there's no room in this beastly garden; we'll go out into the meadow. You catch hold of this jigger and I'll fetch the other one."

I took the "jigger" and obeyed meekly. I knew the Small Boy of old. My peaceful afternoon was at an end, and tea seemed a far-off oasis in a blazing desert.

I passed the Small Boy's uncle on the way to the meadow. He was stretched out on a lounge chair, with a whisky and soda at his elbow—beast.

"Oh," he said, approvingly, "teaching the young idea to shoot?"

I muttered behind set teeth that I should like to teach the young idea to shoot him, and passed loftily on.

The Small Boy had arrived first by means of a short cut calculated to ruin his clothes in the quickest possible time. He had yet another abom—aeroplane in his arms.

"Now you'd better get up that end," he said, decidedly, indicating the farthest, hottest, sunniest spot in the whole field, "and I'll stop here, and then we can pick each other's machines up and send 'em back again."

I toiled up the field. "Now then," yelled the Small Boy.

I did queer things with the propeller and let go of my model, which soared upwards and disappeared in the top branches of a tree on the other side of the hedge. The Small Boy reached the middle distance and sat down quietly.

"Yours is up there," he remarked when I reached him, indicating the tree. I thanked him for the gratuitous information, and waited. "You had better go and fetch it," he continued.

But even a worm will turn, and by this time I was feeling less like a worm than a volcano in imminent danger of eruption.

I walked to the nearest patch of shade and refused to move. When he was sufficiently far up the tree I made tracks for home, despite his shouts, and sought the shelter of my own room till tea time.

* * * * *

The Small Boy's uncle was asleep when I passed. . . . After all, I think he owed me that whisky and soda.

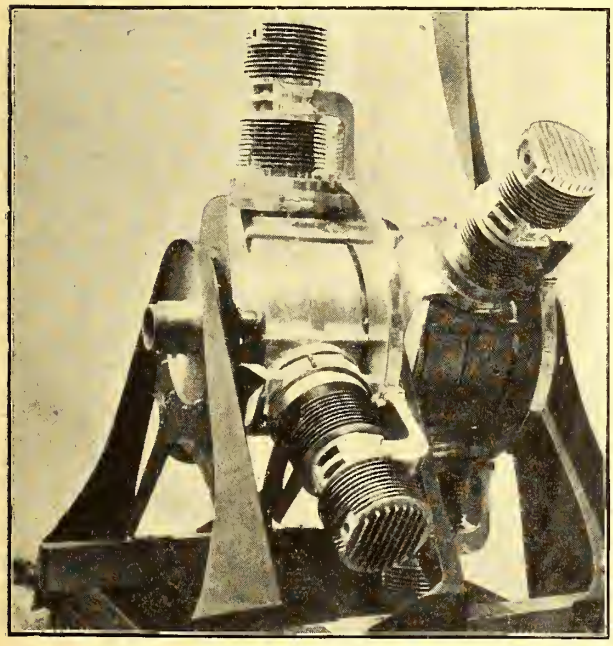
Aviation is excellent—in the right place—and I am quite a keen enthusiast myself; but if the young idea *must* be taught to shoot on a hot summer afternoon, I am, in future—not there.—D. M. Haward.

Engines at the Paris Show.

The engines at the Paris Salon were, if anything, more encouraging than the aeroplanes, for though the aeroplanes have improved to some extent in detail, the bulk of them are practically the same as those shown last year, with the difference that then they were merely new designs, whereas now they are tried and proved flying machines. The engines, on the other hand, show in many cases really marked differences in design and construction. The following are a few particulars of the more notable engines :—

VERDET.—This engine is a rotary, something like the Gnôme in appearance, but with mechanically operated inlet valves in the cylinder head. It attracted considerable attention when shown last year, but for some time after the show it was found impossible to get any length of running out of it, owing primarily to the difficulties of lubrication caused by the oil throwing centrifugally into the pistons and stopping there, and also to the difficulty of carburation and of getting the gas into the cylinders against centrifugal force and round corners. I am told that these difficulties have now been overcome, and that the engine has been running for two hours at a stretch. The engine shown is a beautiful piece of work, and certainly ought to appeal to those who believe in rotary engines. Each cylinder carries four small valves in the cylinder head, two being exhaust and two inlets, all four valves being worked by one rocker. The engine is rated at 75 h.p., with seven cylinders 110 by 140 m.m., and its consumption is said to be one litre of oil and 25 litres of petrol per hour.

L.U.C.T.—This is another rotary engine also similar to the Gnôme and Verdet, but with one exhaust and one inlet valve in each cylinder head, operated by two rockers.



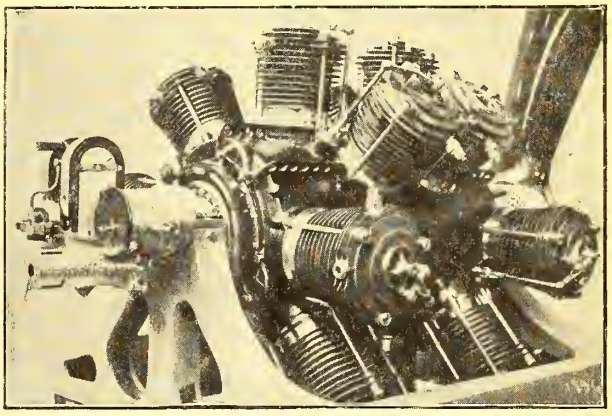
The Reverse-rotary Helium.

HELIUM.—This engine is about the clumsiest in the show, and one which seems still very experimental. It is a two-stroke rotary, and is made in a metal called "Tenax," which from its colour I should judge to be some kind of copper alloy, crank case and cylinders being of the same material. This is made in two sizes—a three-cylinder 90 by 100 mm., rated at 50-55 h.p. at 1,200 r.p.m., and said to weigh 90 kilos.; and a six-cylinder 100 by 100 mm., rated at 120-140 h.p., and weighing 130 kilos., three of the cylinders revolving in one direction and three in the other, and the machine manages to produce twelve explosions per revolution, so that, if it will only work, it ought to be something approximating to a petrol turbine. In addition to the rotary engines the same firm shows a five-cylinder stationary cylinder engine made of cast-iron 100 by 100 mm., rated at 1,200 r.p.m. This engine is, like the rotary engines, air-cooled, and is said to weigh 130 kilos., with an aluminium crank-case.

ROSSEL.—This firm shows two types of engine, one a 40-50 h.p. rotary, very like the Verdet in its detail and workmanship, but with two valves per cylinder instead of four, both operated by a single rocker. The other is the Aviatic Rossel, a very nicely made four-cylinder vertical engine of 70 h.p., 125 by 133 mm., and said to weigh 115 kilos. It is well built and soundly designed on the lines of a car engine, but, of course, is open to the objection that a four-cylinder 70 h.p. engine giving only two explosions per revolution must vibrate considerably.

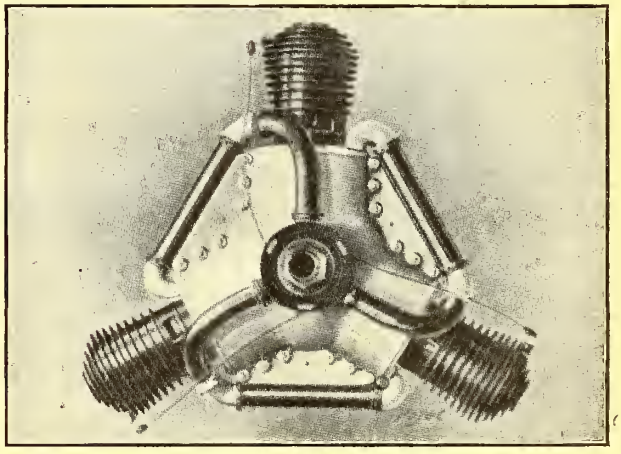
SUER.—These people show some rather neat little engines, ranging from a single-cylinder 8 h.p., 90 by 120 mm., which would be quite nice in a motor launch, to a four-cylinder 60-70 h.p., weighing 100 kilos., and a four-cylinder 90-100 h.p., weighing 110 kilos.

DE DION-BOUTON show an eight-cylinder V type of 100 h.p., built in their usual excellent style and on generally good lines.



The 16-cylinder Burlat.

BURLAT shows some extraordinary rotary motors, in which multiplicity of cylinders is carried to an extreme. The biggest is a 16-cylinder 130-140 h.p. In this the cylinders are arranged in pairs, facing one another, so that the 16-cylinder engine consists in effect of four four-cylinder double-opposed horizontal engines, all buzzing round a common crank shaft. The eight-cylinder 65-70 h.p. is similarly composed of two revolving four-cylinder opposed engines, and there is a smaller eight-cylinder 35-40 h.p. engine similarly arranged. In all cases the cylinders are of cast-iron, held down by rods from the cylinder head to the crank-case.



The "Laviator" 3-cylinder rotary.

LAVIATOR.—An engine which has managed to get itself quite a good name without having done any practical flying is the two-stroke rotary shown by the Societé Laviator. This is a three-cylinder valveless, though it is also made up to a nine-cylinder size. Although the engine is called a valveless, there is, as a matter of fact, a rotary sleeve turning with the motor which uncovers the air and gas inlets at the proper moment. This distributor communicates with a pump which forces first the air and then the gas into the cylinder, the air

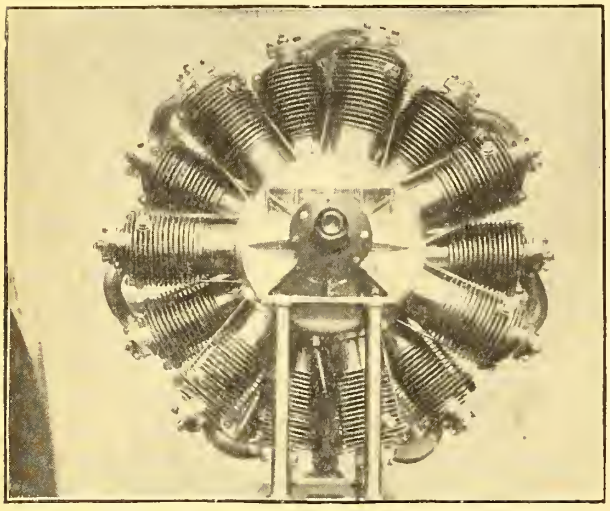
sweeping the burnt gas out in front of it before the fresh gas is admitted, the action in the cylinder being very similar to that in the N.E.C. So far, apparently, the engine has not distinguished itself in practice, but it is certainly quite well made, and is worthy of attention.

FAVATA.—This is a somewhat extraordinary engine, with two pistons on a common piston-rod to each cylinder. It apparently consists of single cylinders complete with their valve gear and crank-shafts, which can be coupled up to one another to make any quantity of cylinders and any quantity of power the purchaser pleases, but, as the whole thing is more or less experimental, it scarecely seems worth while to describe it in detail. The eight-cylinder engine, with its sixteen pistons, is supposed to give 200 h.p.

GNÔME.—The Gnôme people show four engines—a 70 and double 70 (140) h.p., with cast-steel crank-cases, and the usual 50 and double 50 (100) h.p., with machined steel crank-cases, the older type apparently still being superior to the newer type in actual practice.

DANSETTE GILLET show an enormous six-cylinder vertical engine of 200 h.p. for a dirigible, and an eight-cylinder V-type of 120 h.p. Both are nice clean jobs, without anything particularly original about them.

RENAULT.—The well-known firm show, of course, their ordinary eight-cylinder 75 h.p. which has been so successful, but this year they show a small eight-cylinder 40 h.p. built on exactly the same lines, and an enormous twelve-cylinder 100 h.p., which looks altogether too complicated for the ordinary man; but one is, of course, prepared to accept it simply because it is a Rénault.

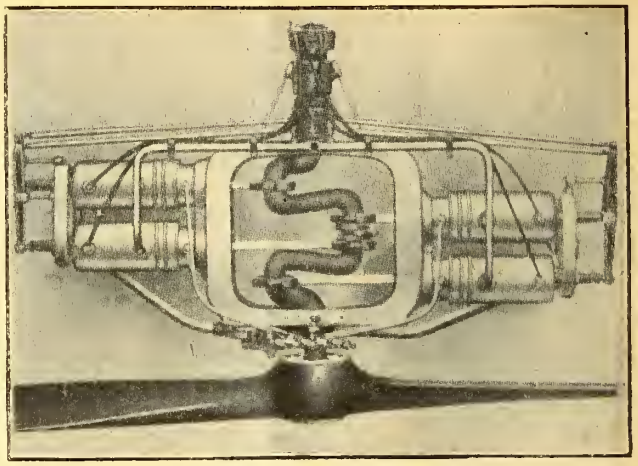


The 100 h.p. Anzani.

ANZANI.—Another of the outstanding engine exhibits was Anzani's. Though in the days of the old three-cylinder Anzani I was as bitterly opposed to it as anyone, I must confess that the later types have quite converted me, especially since I have had an opportunity of observing the behaviour of those on the Deperdussins at Brooklands. Anzani shows a three-cylinder 30 h.p. of the old fan type, but, of course, the chief interest in small engines centres on the three-cylinder Y type, which is reckoned to give 30-35 h.p. at 1,418 r.p.m., with a weight of 55 kilos. Next above this comes the 50-60 h.p. six-cylinder, then the 70-80 h.p. six-cylinder, and finally the 100 h.p. fourteen-cylinder, the last-named weighing 142 kilos.

It is worthy of note that in all these engines, except the first-named, the cylinders, valves and everything else, except, of course, the crank-shaft and crank-case, are interchangeable with one another. Among the noteworthy performances of the 50-60 h.p. is Desparmet's flights for the French military superior brevêt, when he flies three journeys of 100 kms., each between 11 a.m. and 2.31 p.m. Allard, who won the landing prize put up by the City of Orleans, covered 2,000 kms. in doing so, and Anzani himself, a featherweight of 15 stone, put up a flight of three hours on a Blériot with one of these same engines.

OERLIKON.—One of the most freakish looking engines in the show is the Oerlikon, a Swiss engine, built by the great dynamo manufacturers. The engine is a four-cylinder double-opposed horizontal, and has the peculiarity of possessing an open crank case, which suggests considerable oil consumption, although the makers claim the consumption to be only half a litre per hour.

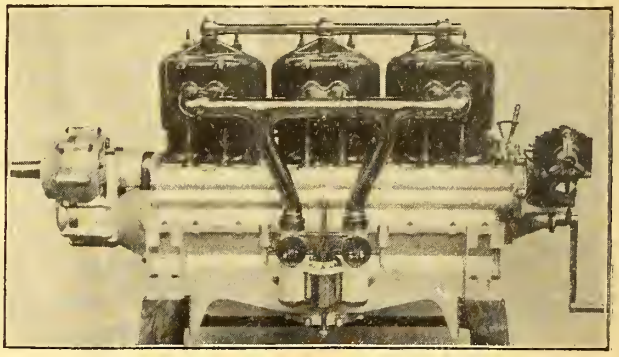


The Horizontal Oerlikon.

The idea of the open crank case apparently is to keep the inside of the engine cool as well as the outside. Another peculiarity is that there is only a single valve per cylinder, or rather the inlet and exhaust valves are concentric. All the bearings run on balls, and the cylinders are made of nickel steel. The crank shaft is apparently forged out of round steel, and is left with its own surface on it. The engine is made in two types—100 by 200 mm. giving 50 h.p. at 1,200 r.p.m., and 110 by 200 giving 60 h.p. at 1,200. The former is said to weight 80 kilos, and the latter 85 kilos complete with magneto, carburetters, water pump and propeller sleeve. Just how much work this engine has done I cannot say, but it is, at any rate, responsible for making at least one monoplane and one biplane fly.

WERNER AND PFLEIDERER.—The great Viennese firm show a very plain, well built engine of the ordinary four-cylinder car type with overhead valves. It is not altogether unlike a Clerget in general appearance, and it is said to give 85 h.p. with a weight of 115 kilos.

S.N.A.—These people show an eight-cylinder V-type engine, 95 by 130 mm., rated at 75 h.p. The engine has very pronounced valve pockets, and, apparently to cool these, four little fans are fitted, driven by gearing from two vertical shafts running up from the central cam-shaft.

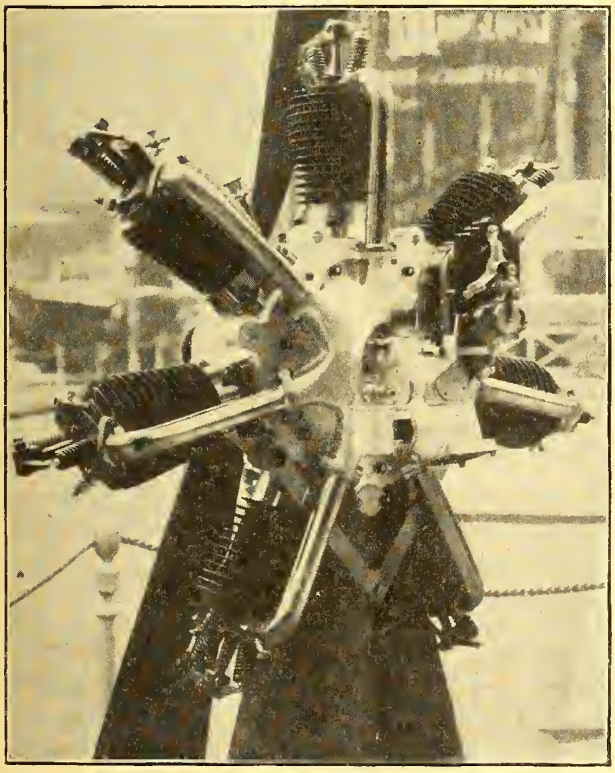


The beautiful Chenu.

CHENU.—Of all the engines in the show I was not more favourably impressed by any than by the Chenus, four of these engines being shown, and all of them being equally interesting. The biggest engine was a six-cylinder vertical, with the cylinders cast in pairs, this engine giving 210 h.p. at 1,200 r.p.m., and weighing 390 kilos., but the pick of the bunch was the 110 h.p. six-cylinder, weighing 183 kilos. In this engine the propeller shaft is geared down by an arrangement of gearing fixed quite independently of any other part of the engine on the long nose which ordinarily carries the propeller. The engine is reckoned to give its power at 1,800 r.p.m., and is guaranteed to keep on doing that speed, so that one can keep the engine turning, and giving really a big power for its weight, and yet run a very large propeller at 900 r.p.m.

Though the engine is free from any particularly special points of design, being absolutely built on car lines—even to the extent of having cast-iron jackets, and valve pockets on either side of the cylinders, so necessitating two cam-shafts—the whole machine is so beautifully made, and all the detail work seems to belong to itesIf so thoroughly that it inspires one with real confidence. The valves are very large, and the exhaust has a nice clean outflow. The magneto has a double distributor so that each cylinder is fired by two plugs at once, as is becoming the custom in racing cars. The same engine is also shown as a 65 h.p. at 175 kilos, but in this the weight is merely saved by doing away with the propeller gearing, so that the engine has to be run rather slower, and so the power is put down at a lower figure. The smaller engine is a four-cylinder, weighing 115 kilos, and gives 65 h.p. at 1,800 r.p.m.

SALMSON.—This firm showed only two of its various sizes in radial engines—a nine-cylinder of 120 by 140 mm., rated at 110 h.p. at 1,300 r.p.m., and a seven-cylinder giving 80 h.p. at 1,250 r.p.m. But a weird horizontal thing with cylinders parallel to the crank-shaft, something like the Lamplough turbine, was also shown.



The new 90 h.p. R.E.P.

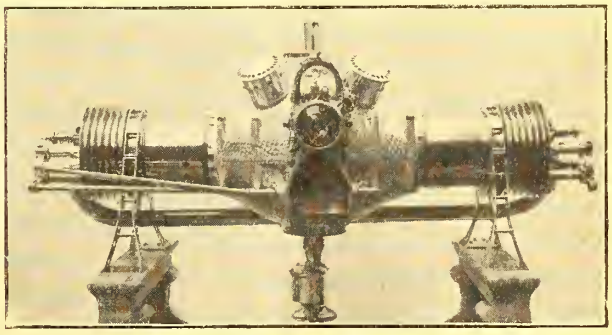
R.E.P.—M. Esnault-Pelterie has produced an exceedingly handsome engine of 90 h.p., which has caused considerable interest. In a general way it is the same as his well-known fan-shaped engines, but there is the important difference that the cylinders are arranged radially all round the crank-case instead of in fan shape.

PANHARD-LEVASSOR.—Another of the outstanding engines of the show is the six-cylinder vertical Panhard. It will be recollected that with this engine Frank Barra successfully drove his big box-kite round the "European Circuit," so that evidently it is a thoroughly practical job. It will be remembered that Dubonnet when he was flying did some excellent work with a similar engine. The firms's real novelty for this year, however, is a 60 h.p. engine, in which the propeller shaft is geared down 2 to 1, being, in fact, an extension of the cam shaft. The engine remains practically unaltered in its general design, and is, of course, a thoroughly good job.

NIEUPORT.—The improved 28 h.p. Nieuport engine is shown on the Nieuport stand, and certainly is a very taking little machine. It remains as before a two-cylinder double-opposed horizontal with valves in the cylinder heads, and a separate rocker for each valve, but the workmanship seems to have been improved, as is shown by the fact that in the recent tests it came out at top of its class for light engines.

Some Engine Figures.

Name of Motor,	H.P.	Bore. mm.	Stroke. mm.	No. of C l.	Weight. Kilos.	List Price. Francs.
Anzani	30	105	130	3	73	4,000
,,	35	105	130	3	55	4,300
,,	45	90	90	7	68	5,800
,,	60	105	125	6	86	9,000
,,	80	115	140	6	115	12,000
,,	100	90	120	14	150	18,000
Beck	35	90	130	—	70	7,000
,,	50	110	130	—	80	9,000
,,	75	120	130	—	85	14,000
Burlat	40	110	120	8	—	6,400
,,	40	95	120	8	—	6,500
,,	70	120	120	8	—	11,000
,,	140	120	120	16	—	22,000
Chenu	50	110	190	4	115	9,500
,,	75	110	190	6	170	13,000
,,	200	150	200	6	390	25,000
Clément-Bayard	100	135	160	4	210	—
Clerget	50	110	120	4	78	10,000
,,	100	140	160	4	155	19,000
,,	200	140	160	8	220	32,000
Dansette-Gillette	35	98	125	4	90	6,500
,, ,,	50	105	160	5	110	—
,, ,,	75	130	160	4	150	10,000
,, ,,	100	130	160	6	250	20,000
,, ,,	120	114	160	8	180	15,000
,, ,,	200	180	200	6	500	35,000
Gnôme	50	110	120	7	76	13,000
,,	70	130	120	7	83	16,000
,,	100	110	120	14	100	24,000
,,	140	130	120	14	130	30,000
Helium (Rotary)	45	90	90	3	70	8,000
,,	60	100	100	3	78	10,000
,,	100	100	100	5	125	15,000
,,	120	100	100	6	145	18,000
,,	200	100	100	10	230	27,000
,, Fixe ', water cooled	55	90	110	3	100	7,000
,,	80	110	110	3	140	9,000
,,	110	90	110	6	185	12,000
,,	160	110	110	6	215	16,000
,, Fixed, air cooled	45	90	90	3	85	5,500
,,	60	100	100	3	105	6,500
,,	75	90	90	5	120	7,500
,,	100	100	100	5	150	10,000
Labor	70	100	210	4	150	9,000
Nieuport	28	130	150	2	68	—
Oerlikon	50	100	200	4	80	6,000
,,	60	110	200	4	85	7,000
Panhard-Levassor	60	120	140	4	160	14,000
Renault	25	120	90	4	100	5,000
,,	30	110	70	8	110	8,500
,,	50	120	90	8	170	10,500
,,	70	120	90	8	180	12,500
,,	90	140	96	12	290	17,000
R.E.P.	45	100	140	5	110	12,000
,,	60	110	160	5	150	14,000
Salmson	60	75	260	7	100	10,000
,,	80	120	140	7	135	13,000
,,	110	120	140	9	160	18,000
Viale	30	105	130	3	75	4,500
,,	50	105	130	5	90	7,500
,,	70	105	130	7	115	10,500
,,	100	105	130	10	145	15,000
Verdet	75	112	140	7	105	12,500



The 28 h.p. Nieuport—Horizontal.

Aviation in the Italian Army.

By W. E. de B. WHITTAKER.

For some time past it has become increasingly evident that the principal effective use of aeroplanes would be for military purposes. Three or four European nations have recognised this and, as is well known, have formed aerial fleets of considerable size. Great Britain even is showing signs of awakening from the sleep of centuries, and of realising that because an idea is new it is not necessarily either unsound or dangerous.

In the contest between Italy and Turkey can be found the first definite proof of the value of the aeroplane in war, and that too under rather unfavourable conditions. A tropical climate has not been considered previously suitable for flying, and yet in Tripoli the Italian military aviators have been making flights on most days of the week, over a district within a fifteen to twenty mile radius of the advanced posts.

Generals Bricola and Frugoni, commanding respectively at Benghazi and Tripoli, testify to the accuracy of the information brought to them by their aerial scouts. In action the aviators, if one is to believe reports, have actually dropped bombs with considerable effect. So far no accident has yet occurred other than such slight breakages as would take place on the average aerodrome. No officer pilot has been captured by the Turks or the Arabs.

Until a few weeks ago the principal aerial scouting has been carried out by the regular military aviators, Gavotti, Piazza, and Moizo, but lately several volunteers have been employed, apparently with great success, at Derna and at Terbrouk, among them being Manissero, Ruggerone, and Cagno.

The small Italian dirigibles, three of which have been sent to the seat of war, have so far done nothing, owing to the total destruction of their sheds a few days back. It will be interesting to observe how far these vessels carry out the expectations of those who believe in such things. Even if the dirigibles should apparently succeed, it should be remembered that the enemy possesses no aeroplanes with which to make an effective defence against or attack on them.

At the end of 1910 the Italian Army possessed ten aeroplanes, mostly biplanes of the Farman type, besides two dirigibles, and was treating the whole aerial question experimentally. To-day aviation has as definite a place in the army as artillery or cavalry.

No divisional nor brigade commander has it in his power to do anything really harmful to the expansion of the new arm, which is, in fact, more highly favoured at the moment than any other branch of the Italian Service.

In the War Office at Rome there is a separate department, under an inspector of the aeronautical services, Colonel Morris, who has entire control of military aviation. Under him is a special brigade commanded by Lieut.-Colonel Motta, in whose hands lies the active control of the different sections of the aerial fleet. Lieut.-Colonel Motta is responsible to Colonel Morris, who, in his turn, reports to the Minister of War.

The brigade is divided into four separate sections, as follows :—

(1) A collection of companies dealing with wireless telegraphy, aeronautical details, etc.

(2) The section of aviation, under the command of Lieut.-Colonel Cordero di Montegronelo. There are at present three military aviation camps, at Somma Lombardia in Ticino and at Avanio and Pordenone in Friuli. Three others are in the process of formation. Each camp is under the command of an officer-pilot, who deals directly with headquarters on all important matters. Such things as repairs, construction, alterations, etc., he may do in the workshops erected on the grounds without submitting any request to Rome. Considerable latitude is allowed these officers, which, under the present conditions of aviation, is at least advisable.

Great harm may result from stupid restrictions imposed by senior officers whose sole conception of an aeroplane is as of something entirely mythical, a cross between a parachute and a kite fitted with an engine, of great danger, and only of use to accelerate promotion, and that too in the junior ranks only.

Even in France aviation has suffered from this. At Nancy a few months ago two officers, after descending from long flights, were ordered by a somewhat unintelligent superior officer to practice equitation for an hour or two, so that they might not forget how to ride! Such treatment is not encouraging.

Italy has at present forty aeroplanes and as many officer-pilots. This number is being added to daily. All the aeroplanes in use in the Italian army are of French construction, though I understand the Government intends to build machines as soon as sufficient experience is gained.

(3) The dirigible section, under the command of Commander Scelpi (Royal Italian Navy). This section has control over the sheds at Venice, Verona, Ferrara, Vigna di Valle, and Tripoli. It has at present three dirigibles, of 4,500 cubic metres capacity, and has in the course of construction three of 12,000 cubic metres.

It is to be hoped that Italy will pause a little before committing herself to great expense in the construction of these vessels.

(4) The factory, under the command of Major Petrucci and Captains Crocco and Riccaldoni. This factory is at present used entirely for the construction of balloons, dirigible and otherwise. Probably at a later date aeroplanes will be built here.

It is not quite clear in what manner these different sections work together. Why the first section should consist of several services not really connected with each other is inexplicable. One would imagine these details should be treated as such, and be in the relation of divisional troops to a division. But, nevertheless, the organisation seems excellent, and is certainly capable of easy expansion.

It is an ill wind that blows nobody any good, and the war in Tripoli has certainly been of considerable use to aviation, in that not only has it shown the practical utility of the aeroplane as a scout and as a weapon, but is, at the moment, testing the machinery of the organisation which controls the fourth arm.

For much of the above information I am indebted to that excellent French paper, *Le Matin*, which sets an example to all British papers in the attention it gives to aviation, both civil and military.

The Blackburn military three-seater, with Renault engine, which was flying so well prior to the accident at Filey.

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THE AERONAUTICAL SYNDICATE, LTD.,

ESTABLISHED MARCH, 1909.

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Figures from the Paris Show.

By P. K. TURNER.

Below will be found a list of some of the machines at the French Show, with a few particulars of them. In getting out this list I have selected only machines which fly, and in the particulars I have included only those figures which are likely to appeal to a student or a buyer, and have excluded those which are of interest only to the constructor of copies. I have arranged the machines under separate heads for monoplanes and biplanes, and in each case have placed them in order of useful load carried. Where several machines are designed to carry the same useful load I have given the average figures for them. Some rather interesting but very contradictory results transpire.

As a general rule, of course, the surface seems to increase directly with the useful load, an exception being especially the Paulhan-Tatin torpedo, which has the second least surface of any machine, although it carries a greater load than three others. This, of course, is made possible by its extremely high speed, which is rated at 81 miles per hour, though I have heard it stated on very good authority that the machine has actually reached 100 miles per hour, in spite of its having only a 50 h.p. engine.

A second exception is the Morane-Saulnier racer, which is designed to carry a load of 550 lbs. and yet has a surface of only 125 square feet. This again is a high speed machine. The Aviatik monoplane, however, and the Savary biplane, which are both very fast, show that small wing surface is not a necessity for high speed.

As examples of efficiency we have, of course, first and foremost, the Nieuport, which, with 28 h.p., carries 308 lbs. useful load at 75 miles per hour. It has this year a rival in the Morane-Saulnier racer, which carries 550 lbs. useful load at 75 miles per hour, with a 50 h.p. engine, and in the three-seater Deperdussin, which carries 970 lbs. at 68 miles per hour with 100 h.p.

The prices appear to be fairly even, increasing directly with the useful load carried. The Caudron retains its place as a run-about machine at a ridiculously low price, although the firms of Blériot, Deperdussin, Nieuport and Morane-Saulnier are all showing so-called "popular" machines. These machines are certainly cheaper than they would have been a year ago, but, on the other hand, their price averages £525, as against £360 for the Caudron. Although the Caudron is a biplane there is only one of the four "popular" machines mentioned which exceeds it in speed. The Caudron flies at 56 miles per hour, the Blériot at 50, the Deperdussin at 53, the Morane-Saulnier at 56, and the Nieuport at 75, this averaging 58 m.p.h., as against 56—and it is worthy of note that the Nieuport, which brings the monoplane average above that of the Caudron, is the most expensive "popular" machine at the Show, being listed at £720. It is noteworthy that the other biplanes are in every instance lower both in efficiency and price than the monoplanes designed for the same useful load.

Among the medium-powered machines we find the Paulhan-Tatin and the R.E.P. exceedingly expensive, chiefly, of course, on account of their peculiar construction. Among the others there is not much choice. Among the biplanes the Breguet also is exceedingly expensive, which seems to point to the fact that, whatever may be the advantages of steel construction, cheapness is not one of them, even when manufacture is carried on in fairly large quantities.

The German machines—the Aviatik and the Albatros—seem to be in price very similar to the French. It is curious that the machine designed for the heaviest load in the whole show is not a biplane, but a monoplane—the Deperdussin three-seater. This seems startlingly expensive, although it must be remembered that the great part to its cost is due to the very expensive engine.

On examining the flying or functional design of the machines as a whole, one does not see much advance in theory over last year, for the main points of most of this year's machines are not new, but were seen last year in the Nieuport. The Phillips wing section is coming into its own, as also is the full-bodies streamline fuselage. The plan-forms of wings have not altered much, although a tapered plan seems to be in favour. The dihedral angle, of course, is almost uniformly adopted, although there seem to be very few machines which have what might be described as fancy dihedrals. The Paulhan-Tatin is an exception to this, and it would be interesting to hear the results of experiments with a similar machine with an ordinary dihedral angle.

[It is said in Paris that most of the flying done by the Paulhan machine has been done with flat wings, with a slight dihedral.—Ed.]

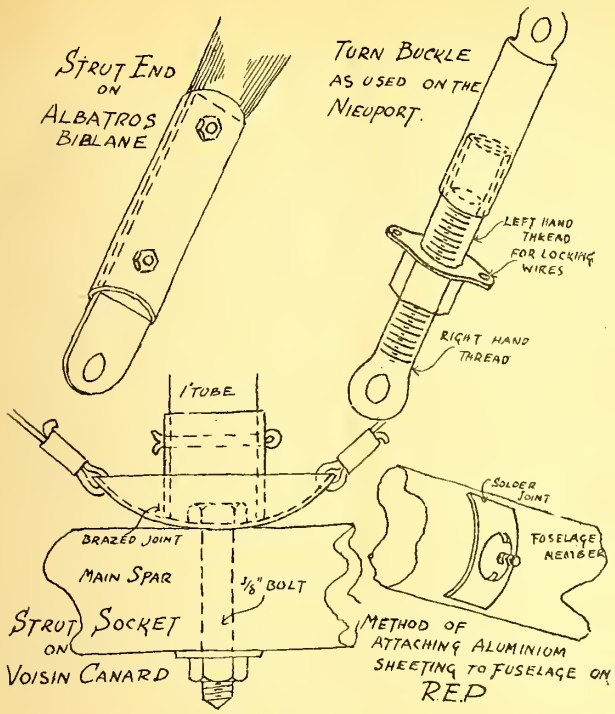
The flattening of wings towards the tips and the diminution of angle of incidence (collectively and colloquially known as "wash-out") do not seem to be regarded with very much favour, which strikes me personally as very good.

Construction, of course, has advanced immensely, as was only to be expected, but the subject is much too much for me to touch on at all here, although some details are given in the sketches on page 15.

One striking point is the variation in size of the machines. Whereas originally one simply built an aeroplane which (perhaps) flew, this year we see machines of surfaces from 125 to 590 square feet, from 28 to 100 h.p., adapted for useful loads varying from nil up to nearly 1,000 lbs., and running in price from £355 to over £1,800.

Another matter is the difference in the ideals of the designer. This is not yet properly understood in England, and we still have manufacturing firms showing great satisfaction when their machines get off the ground. In France this is regarded as a mere nothing, and the designer's aim is not simply to make a machine which flies, but to make a machine which is easily controlled under the worst conditions, which will go on flying, and which will land safely without breaking in the act. I am glad to say that some few of our British constructors have at last learnt that this is the correct point of view, and this, I think, is perhaps the most encouraging point which I have yet noticed in my various conversations with British constructors.

Machine.	Area in sq. ft.	Useful loads in lbs.	H.P.	Price. £	Chassis. Wheels.	Chassis. Skids.	Speed in m.p.h.
MONOPLANES—							
Blériot, popular	170	286	35	350	Two	None	50
Deperdussin, popular	170	286	35	350	Two	Two	53
Average ...	170	286	35	350			51.5
Nieuport ...	182	308	28	720	Two	One	75
Paulhan-Tatin	142	330	50	1,000	Two	None	81
Morane-Saulnier, popular	160	375	35	680	Four	Two	56
Blériot, cross-country	170	440	50	860	Two	None	59
Borel, cross-country	160	440	50	880	Two	Two	72
R.E.P. ...	228	440	60	1,200	Two	One	69
Bristol, two-seater	210	440	50	950	Two	Two	69
Average ...	192	440	52.5	972			67
Deperdussin, cross-country	270	550	50	920	Two	Two	68
Morane, racer	125	550	50	920	Two	None	75
Nieuport, two two-seater	256	550	50	1,040	Two	One	69
Average ...	217	550	50	960			71
Aviatik ...	285	660	70	1,000	Four	Two	72
Blériot, two-seater	285	660	70	1,200	Two	None	59
Borel, two-seater	228	660	70	1,020	Two	Two	59
Deperdussin, two-seater	320	660	70	1,080	Two	Two	68
Average ...	280	660	70	1,072			65
Deperdussin, three-seater	365	970	100	1,820	Two	Two	68
BIPLANES—							
Caudron ...	228	286	36	360	Four	Two	56
Zodiac ...	365	440	50	1,120	Two	One	59
Goupy ...	250	550	50	1,120	Two	None	56
Breguet, two-seater	375	620	75	1,400	Three	One	56
Albatros ...	456	660	100	1,200	Four	Two	56
M. Farman ...	400	660	70	1,000	Four	Two	53
Savary ...	590	660	70	1,040	Two	One	62
Average ...	482	660	80	1,080			57
Astra	550	880	80	1,120	Two	One	56
Bréguet, three-seater	375	880	100	1,800	Three	One	59
Average ...	462	880	90	1,460			58



Some Show Details.

Herewith are some details of fixings on machines at the Paris Show drawn by Mr. Petre (more commonly known as "Peter the Painter"). Mr. Petre has shown very clearly several noteworthy points in the Albatros, Nieuport, Canard, R.E.P., Bréguet, and Train machines, and they will well repay close study by constructors, amateur and otherwise.

An Early Warping Patent.

An interesting discovery has recently been made in connection with the work of Louis Mouillard, who was known as a student of bird-flight as far back as 1889. In that year the late Professor Octave Chanute, who was in France during the Exhibition, heard of Mouillard, and was at some pains to get into communication with him. Shortly after, Mouillard sent to him the MS. of his book, which was to be called *Le Vol Sans Battements* (*Flight Without Flapping*).

In the year 1892 Chanute and Mouillard together took out a French patent in the matter, the original of which is in Chanute's own hand; the portion dealing with warping runs as follows:—

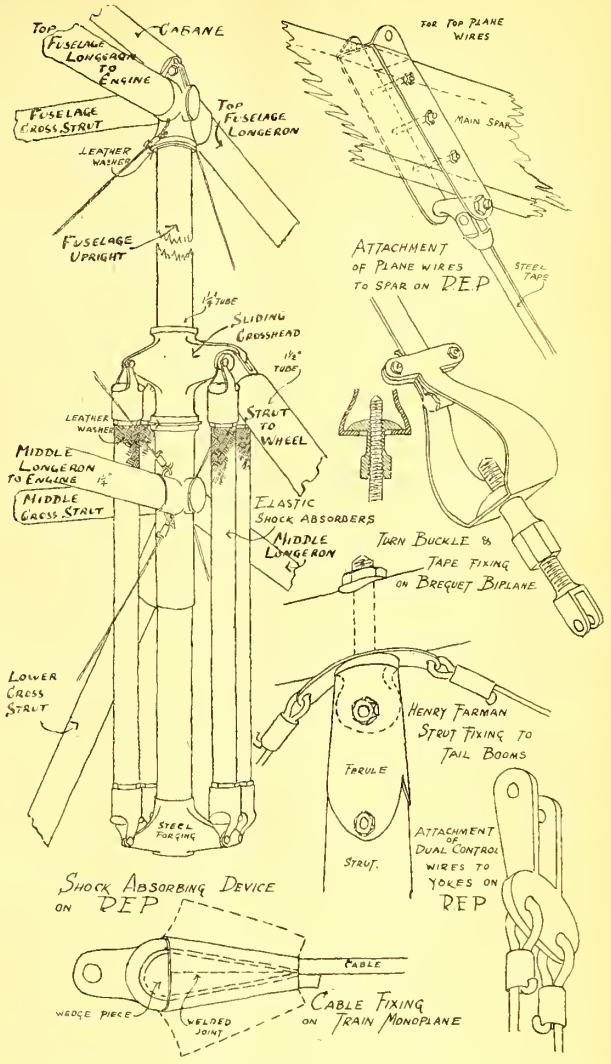
"Part of the plane, at the trailing edge of each wing, is left free from the rest at the back and sides. Cords are fixed to the rear edge of this part, and run to handles placed near the roots of the wings. On pulling either of these handles, the corresponding part of the wing is curved downward, thus increasing the resistance on that side, and making the machine turn in that direction."

This undoubtedly opposes another prior claim to the Wright patents, though it has no effect on the still earlier patent of Ader, which is dated in 1890.

The passage in Mouillard's book, from which the patent was drawn up, runs:—

"For turning in the horizontal plane, the resistance of one wing is increased, so that it tends to travel at a less velocity than the other. This is done by warping—(here the author uses the verb "gauchir," which is now invariably used in France)—*by apparatus provided for the purpose, this part of the lifting apparatus (referring to a drawing in the text), so as to cause retardation. The warping is effected simply by a cord running in rings and provided with handles, the working of which, when properly learnt, will give the necessary steering effect."*

It is obvious that Chanute learnt the possibility of warping direct from Mouillard, and it is noteworthy, in this connection, that in April of 1903, when the Wrights began their experiments at Dayton, Chanute, who was working with them, came over to France to try and learn more of Mouillard. The latter, however, being in advance of his time, had died at Cairo, in 1897, in the deepest poverty.



Chanute therefore addressed himself to Mouillard's sister, Mme. Teillard. She, not knowing whether or no her poverty-stricken brother had left any papers, referred him to another relation, M. L. Camoin, of Nice, to whom Chanute repaired, only to meet with the reply that the family dissociated itself from Louis Mouillard, and that he did not know if there were extant any of his papers.

Chanute, evidently realising the importance of the MSS., made liberal offers, and took immense trouble to find them, but in vain, and they have only lately come to light.

The President of the Cairo section of the Ligue Nationale Aérienne heard, quite by chance, that some documents, bearing the name of Mouillard, had been found at the back of a cupboard at the Consulate. He purchased them for the sum of 35 francs, and forwarded them to M. Henry Couannier, president of the L.N.A. working committee, who instantly appreciated their value. M. Couannier made an exhaustive inquiry, in the course of which the above facts were brought to light, and the work is now at last to achieve its long-delayed publication.

To Amuse the Children.

A lecture on "How Men Fly" is to be given at the Passmore Edwards Hall, Tavistock Place, W.C., on Saturday, the 13th, at 3.30 p.m., by Colonel H. S. Massy, C.B., president of the Young Aerial League. Members of the League and boy scouts in uniform will be admitted free. Children who are not members will be charged 6d. for admission, while parents and friends accompanying members and non-members will be charged 1s. 6d. Tickets may be had from the Hon. Secretary, the Young Aerial League, 277, Strand, or by telephoning Gerrard 9,652.

The Week's Work.

Monday, December 25th.

Brooklands.—Lieut. Spencer Grey, R.N., out in afternoon on his new Blackburn in 15-m.p.h. wind for couple of circuits. Graves, otherwise "Darracq," of "Whirling the Wheel" fame, out on Avro-Green, and Setti also on same machine.

Tuesday, December 26th.

Brooklands.—Only machine out was Blackburn, with Lieut. Spencer Grey, R.N., at wheel. Wind and rain bad, but pilot managed some circuits.

Huntingdon.—Exhibition flights by W. B. R. Moorhouse on Blériot, and Gordon Bell on Radley and Moorhouse two-seater. Former doing well, but came down low over flooded part of aerodrome, caught by gust and dropped till touched water. Fortunately machine fell sideways and threw him out before turning upside down, otherwise pilot might have been held down under fuselage and drowned. Bell did solo test flight, and then took up Jolly, manager of aerodrome, as passenger, but buckled a wheel on landing.

The Plain (Army School).—All N.C.O.'s and men who wished allowed leave from 22nd to 29th. Although no one in attendance, Lieut. Barrington-Kennett went up for an hour on Army Nieuport, astonishing visitors to this salubrious spot.

Wednesday, December 27th.

Brooklands.—Quite good day. Lieut. Parke, R.N., out on Avro-Viale in fine style. Got up to 2,500 ft. and went out over Addlestone and Weybridge. Setti and Graves practising on Avro-Green nearly all day, Graves doing very good straight flights, and delighted with machine. Sopwith, just back from Paris, very busy on Martin-Handasyde, taking up nearly a dozen passengers, among them his two sisters, Mrs. Handasyde, and Dashwood Lang. Gill practising on Deperdussin taxi.

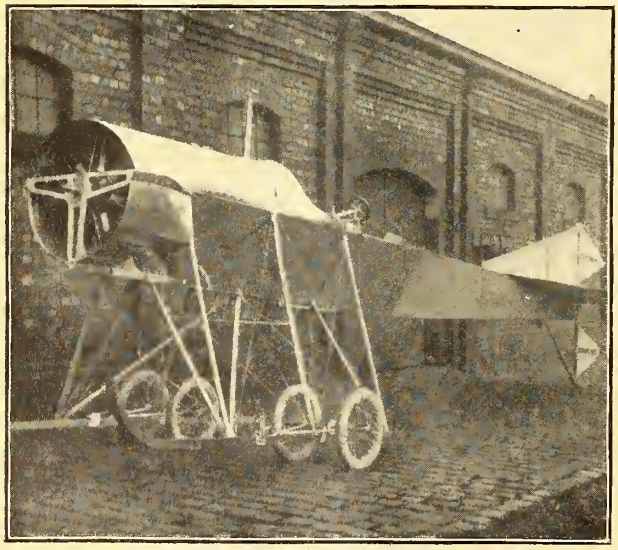
Lieut. Spencer Grey, R.N., out on Blackburn in afternoon, going up to 1,500 ft., making three flights of about half-hour each. Then up with Lieut. Parke, R.N., as passenger for six circuits. B. C. Hucks later, on same machine, up at 2,000 ft. out over Weybridge and district for half-hour. Mr. Grey then up to 1,000 ft. again. Blackburn flying extremely well.

Eastbourne Aerodrome.—F. B. Fowler did first of tests for his brevêt in fine style, flying at average height of 200 feet. Figures of eight particularly good, and landing made two yards from the centre of circle of 50 yards. Five circuits were done in seventeen minutes. Darkness prevented second test. Machine was 50 h.p. Blériot.

The Plain (Army School).—Lieut. Barrington-Kennett out on Nieuport doing series of landing tests, for own benefit. Tests proved all right, and Nieuport still intact. Marvellous, considering general opinion of chassis design.

Thursday, December 28th.

Brooklands.—Lieut. Spencer Grey, R.N., out very early on Blackburn doing circuits with fine banked turns, and again in afternoon, but then only able to do one circuit and some straights owing to strong wind. Mr. Grey now rejoined his ship, but during short leave has shown himself to be remarkably fine pilot. Graves and Setti out on Avro-Green.



The Fuselage of Lieut. Spencer Grey's Blackburn.

Mr. T. O. M. Sopwith flying the magnificent Martin-Handasyde on Saturday last.

Friday, December 29th.

Brooklands.—Bad day, and little doing. Graves and Setti both at work on Avro-Green. Gill making excellent progress on Deperdussin taxi. Bristol school reopened after holiday, and Fleming hard at work with pupils. Garne made attempt for brevêt, but missed last right-hand turn.

Brighton-Shoreham.—Gassler, Kent and Hamilton Ross, of Chanter School, out most of morning. Weather rest of week calm, but too foggy for school work.

The Plain (Army School).—Capt. Fulton, Lieuts. B. Kennett, Reynolds, and Hynes all out, giving good exhibitions, especially Mr. Barrington Kennett, who tried to do a measured mile (speed), and (to quote himself) "lost the ground" owing to mist.

Saturday, December 30th.

Brooklands.—Good weather and very busy day. In morning Lieut. Parke, R.N., went for first portion of Superior

Certificate, and passed with ease on Avro-Viale. Instead of doing 1,000 ft. altitude test, went up to 2,300 ft. Stopped engine completely at 1,000 ft. on way down, instead of at 500 ft., and landed with fin glide 86 yards from mark. Somewhat bumpy landing, but no damage done. Mr. Parke has now honour of being first Navy man to go for Superior Brevêt.

Gill and Sabelli both practising on Deperdussin taxi. Setti and Graves both at work on Avro-Green. Later Parke did fine exhibition flying on Avro-Viale. Spencer up flying well on own biplane. Pashley testing repaired Humber. Blondeau, and later Lieut. Hewlett, R.N., out on Blondeau-Hewlett biplanes, former saving possible collision with Fleming, who was gliding down with engine stopped, by very sharply banked left turn. Fleming, on Bristol, out with numerous pupils, and some of pupils doing short flights alone.

Interest of afternoon really centred on Sopwith and Martin-Handasyde, who put up fine performance, taking passenger after passenger and flying for nearly three hours, with only stops to change passengers. Last passenger was Lieut. Parke, R.N., and Sopwith evidently started out to test his nerve, doing violent banked turns, cutting off engine to within a few feet of flood-water, and generally playing tricks calculated to cause more excitement than entertainment to spectators. Nevertheless, a splendid exhibition of fine flying on a magnificent machine.

Brighton-Shoreham.—Tests of Collyer-England biplane resumed, England rolling and Dowland doing straight flights.

The Plain (Army School).—Capt. Fulton out on F. 4 to test atmospheric conditions, prior to Lieut. Reynolds testing new type of aneroid barometer. Very gusty, so tests fell rather flat as Lieut. Reynolds was unable to coax his mount any higher than 800 feet. Weather and language shocking.

Sunday, December 31st.

Brooklands.—Very little flying, in spite of good weather and a large crowd. In morning, Lieut. Hewlett, R.N., out on Blondeau-Hewlett machine. Afternoon, Blondeau out for a tour over St. George's Hill, followed by Hewlett on same machine. Spencer tried short flight, but in trouble with petrol feed. Sopwith, after one circuit solus on Martin-Handasyde, took passenger and departed *en route* for St. Albans. Gill out on Deperdussin taxi, making long straight flights. He shows immense promise, and should be an "elect" pilot before long. Setti doing straights on Avro-Green.

Brighton-Shoreham.—Davies out on Chanter School Blériot. England and Dowland rolling on Collyer-England machine.

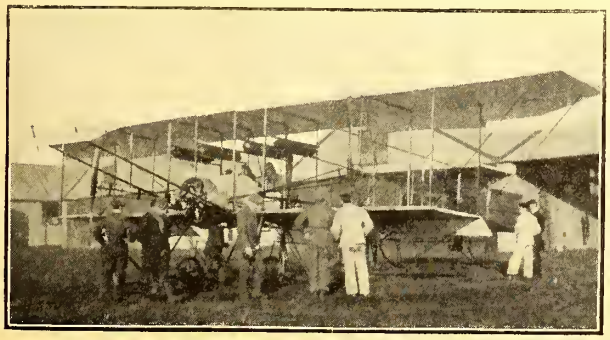
The Plain (Army School).—Nothing doing except repairs to motor-car by "Mac," assisted by a group of willing (?) helpers.

A Successful First Machine.

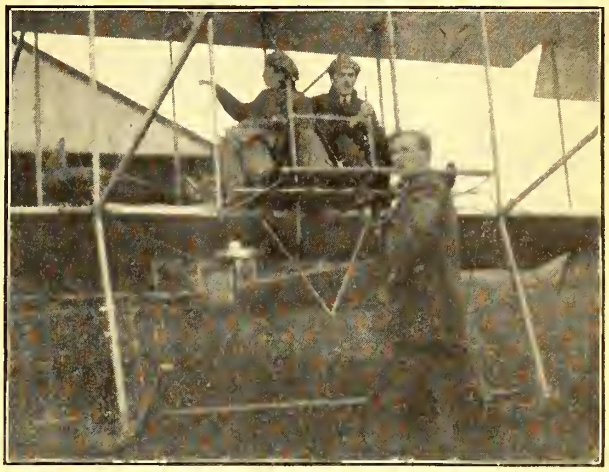
The new "Chanter" monoplane was out for its initial tests on Monday last at the Brighton-Shoreham aerodrome. Mr. Chanter got her off for a straight flight within a few minutes of starting up. This is the first machine of Mr. Chanter's own build, and he is to be congratulated on his successful first attempt.

Feminine Flying.

The Coupe Femina, which is awarded each year to the aviatress who has covered the longest distance over an aerodrome, has been won for 1911 by Hélène Dutrieu, who flew a biplane 254 kilometres (158¾ miles) in 2 hours 58 mins., on December 31st. Jane Herveu, flying at Compiègne on a Blériot, was a close second, having covered 248 kilometres (151 miles) in 2 hours 41 mins.



The triple-twin Short at Eastchurch.



The double-control Short biplane, used to train Territorials

An Addition to "THE AEROPLANE."

The editor has pleasure in announcing that Mr. W. E. de B. Whittaker, who is well known to motorists and aviators, has joined the staff of this paper.

Fighting: Fast, Furious, and Effete.

A desperate duel with swords was fought in Paris on Sunday last between M. Fournol, Deputy for Aveyron, and M. Fabry, a pilot-aviator. The dispute arose out of a discussion on politics, not aviation. In the fourth round M. Fournol was wounded in the right forearm, but insisted on continuing the duel.

In the sixth round he received a thrust from the aviator's sword in the right side of the chest, but happily it struck a rib and only slightly penetrated the flesh. Simultaneously the Deputy managed to wound the aviator just above the eye. After this the seconds put an end to the fight. The adversaries thereupon shook hands and made up their quarrel. It seems a pity that M. Fournol was not also a pilot, in which case the only honourable combat would, of course, be a tourney with lances at not less than 200 metres.

The Aeronautical Society of South Africa.

The Journal of the Aeronautical Society of South Africa is now ready for publication. Any member desiring extra copies can obtain them by remitting to the secretary 2s. 6d. for every additional copy required.

Captain Monreal, who has for some months kindly undertaken the duties of hon. secretary and assisted considerably in the preparation of the journal, is shortly leaving for England. Major Rogers will perform the duties of hon. secretary until one is appointed. It is hoped that some members of the society will kindly offer their services for this post.

Members are particularly requested to note that the permanent postal box number of the society after January 1st will be 844, Pretoria, and, owing to recent changes of secretaries, letters are liable to go astray unless addressed to this box number.

The Royal Aero Club of the United Kingdom has notified this society that they desire it shall represent them in the Transvaal. Negotiations are pending with the Royal Automobile Club of South Africa, which is also representing the Royal Aero Club. It is desirable that the society should add a few more active members to its council to enable it to officiate and assist in demonstrations which may soon be expected.

A memorial to be presented to Parliament has been drafted soliciting concessional Customs and railway rates for aircraft and their appurtenances.

There is a probability that an aerodrome will be laid out at Parys to be managed under the auspices of this society. Negotiations are in hand regarding the formation of a branch at Bloemfontein and probably in Maritzburg. A model club has been formed in Johannesburg, and it is hoped that a similar club will be started in Pretoria. The secretary of the Johannesburg club is Comper Gray, Henwood's Arcade.

The "Willows" firm are inquiring about hydrogen, with a view of sending a dirigible out here for demonstration purposes.

Wanted—Pilots.

An aeroplane pilot, when he has learnt his business, is a very useful assets to any military force. The War Office apparently recognises this, and proposes to train certain selected officers—100 or less, it matters little—who will get their certificates, return to their own units, and after some months or years will undergo a "refresher" course, just to keep their hand in.

Colonel Hunter-Weston has publicly announced the official view that civilian pilots are not wanted; they do not possess the necessary military knowledge for accurate scouting. One hundred officer-pilots are enough, it is thought by the authorities, for any conditions of warfare, heedless of the fact that the preliminary engagement between any well-equipped armies will be waged by the aviators and, as Captain Burke has pointed out, both sides will strive for the command of the air before opening the main attack.

Whatever method may be employed by rival aeroplanes to fight each other—a problem to be discussed in another article—the fact remains that in nine cases out of ten the one defeated will contain when it reaches the ground—if not before—a dead man. The struggle will go on until one side or the other is practically annihilated.

We can by a continuous process of reasoning imagine two classes of war machines, one very swift fighting type, manned by two at most, scouting ahead of a more deliberate type carrying at least three men, probably more. The former would protect the latter, and be under standing orders to engage any hostile craft sighted, opening the way for the true scout to do its work. In aerial war we may, therefore, forecast a reversal of the usual land and marine tactics—in the air we shall fight first and scout afterwards.

And as for the question of pilots, is it possible to expect an officer to drive an aeroplane, scout, make sketches of the disposition of the enemy, beat off hostile attacks, and operate the wireless installation—with which most foreign aircraft will be fitted by this time next year—all at the same instant?

An efficient aeroplane scout requires high training in tactics and generalship, a good knowledge of the country, the ability not only to detect troops and artillery, but to know where to look for them, and their approximate number, purpose and objective or destination when found, and besides these things, the aptitude of making accurate lightning sketches and of preparing rapidly a detailed account of the disposition of large numbers of combatants over a wide expanse of country.

An efficient military pilot must not only know how to drive his machine in all conditions and over any kind of country, but must be able to repair any slight damages, and, above all, must be a first-class aero-motor mechanic. Just as no two aeroplanes fly exactly alike so do no two motors run the same. No more suicidal policy can be imagined than to train a small body of officer-pilots for a month or two a year and on the outbreak of war furnish them with a machine and motor quite new to them, send them out in weather they are unaccustomed to, over ground of a nature with which they are probably unacquainted, and expect them to bring back accurate and detailed information.

Pilots need to be flying constantly and continuously. It is a business and an art, not a hobby to be picked up in a spare week or so. A pilot for war use must know his machine and motor, and have experience of weather all the year round and of all sorts of ground, and while it is perhaps inadvisable for him to be a civilian, *there is no need for him to be an officer.*

The suggestion is therefore (1) That a large permanent corps of pilot-mechanics should be raised who would have no other duties than those of flying and caring for their machines. (2) That all staff officers should go through a yearly course of scouting from aeroplanes, and it would be all the better if a course of wireless telegraphy were added, though it is most likely that in the large war craft of the future a separate wireless operator will also be a passenger.

In this way there would always be a large number of pilots in readiness, free from the etiquette, conservatism, irksome duties and extraneous knowledge not bearing directly upon flying, which must always handicap the regimental, or staff, officer, while the officer-scout could be trained up to a maximum pitch, relieved of the strain of piloting and of acquiring a taste for mechanics often distasteful and generally incompatible with his rank and position.

It is quite useless to treat the aeroplane as a pretty toy which may or may not be of use in warfare. To decide once and for all that it is of supreme importance to develop its uses to provide and maintain a body of trained pilots and worthy machines, to map out the whole country into air-ways, and to procure efficient scouts, not over-worked, underpaid jacks-of-all-trades and masters of none; this is a programme worth carrying out, and let us see to it that it is done. T. O'B. Hubbard.

A New Naval Monoplanist.

The Navy seems to have supplied quite a notable monoplane flyer in Lieut. Spencer Grey, an ex-pupil of the Blondeau-Hewlett biplane school. Mr. Grey recently bought a Blackburn monoplane, which he brought to Brooklands. He made his first attempt on it on December 22nd, contenting himself with rolling and hopping. On the 23rd he took the machine up properly, doing circuits all over the aerodrome, and then, after a short rest, went up again for half an hour, reaching 1,000 ft., and landing with his engine absolutely stopped. On the 24th, 25th, and 26th, in spite of bad weather, he was out again, making short flights, and on the 27th he was up at 1,500 to 2,000 ft. on three occasions for about half an hour at a time, and also carried a passenger. It is only to be hoped he will be able to get sufficient shore leave to keep in practice, for he is much too good a flyer to be lost to the Naval aviation branch when it is properly developed.

The Collyer-England Biplane.

Our representative has recently had an opportunity of examining the Collyer-England biplane at Shoreham. The machine is a tractor biplane with a 30 h.p. two-cylinder horizontal double-opposed engine, and is rather nicely put together.

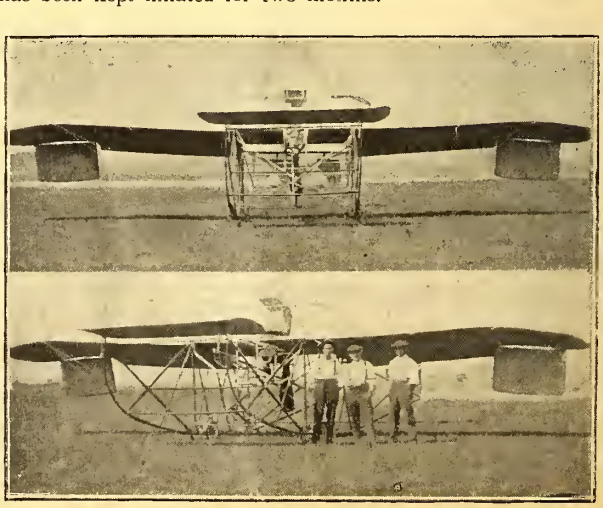
The planes are very heavily cambered, the machine being designed for 35-40 m.p.h. The surface is 308 sq. ft., with a span of 28 ft. and chord of 5 ft. 6 in. There is a dihedral of 8 in. on the outer sections. The chassis is built up on the centre cellule, and has a wheel track of nearly 8 ft. It is more or less of the usual wheel and skid type, the outstanding point being that instead of rubber bands over the axles there are leather bands, connected at their rear ends to rubbers lying along the skid.

The fuselage is triangular, and is built of three-ply wood, with no wire staying; the control is, more or less, of Deperdussin type, with one or two detail variations which may improve it.

The machine has been out rolling several times, but has only recently reached the straight flight stage, owing to faults in the engine.

More Flying over Paris.

December 27th being comparatively calm, there were several flights over Paris. The first was Benoist on a military Voisin, who started from Issy-les-Moulineaux and evoluted over the Grand Palais. Then Prévost, testing two new military Deperdussins, made two separate flights along the Seine, and later Nardini, on a Deperdussin, with an 80 h.p. Anzani, made a flight up the Champs Elysées. In the afternoon the Zodiac dirigible "Capitaine Ferber" came over from Saint-Cyr. It is interesting to note, as compared with the experiences with the envelopes of dirigibles in this country, that this dirigible has been kept inflated for two months.



The Metzgar-Leno Monoplane, recently experimenting at Shoreham.

Why is the Model Aero Club Movement a Failure?

By "AERO-ASPIRANT."

It has been ascertained from figures recently published that no fewer than eighty aero clubs have been inaugurated in this country during the past three years. In itself this is a most significant figure, and would prove upon first sight that aviation had been greeted with enthusiasm by our younger generation.

At the present moment, however, after carefully studying the facts, it is safe to say that, out of the large number of clubs formed, no more than twenty-five are in existence to-day! This is a position greatly to be regretted, for it seems almost a calamity that organisations promoting such an entrancing pastime as model aeroplane building—the most fascinating hobby yet devised to engage the minds and leisure hours of our youthful community—should end in dismal failure. That there is a reason for this is certain, and in endeavouring to arrive at a definite conclusion we must trace the origin of the aero club movement.

When first the news of the early exploits of the brothers Wright was received in this country it was greeted with considerable interest by the people. Being much of a novelty, the Press was quick to print flaming accounts of the flights which appealed to the people's imagination, and information was eagerly perused. As success followed success this interest increased, and a bright future for the new science seemed assured.

But the first fatal accident seemed to cast a cloud upon the outlook, and as the death roll increased in a somewhat alarming manner, the public opinion gradually changed to one of awe, the aspect becoming altogether oppressive.

As time went on and the flying machine still survived and performed feats never before thought possible, the old interest was to a certain extent revived, and it was found necessary to publish periodicals in the interests of the new science, to promote and advance aviation.

The promoters of these papers, besides wishing to interest those directly and intimately concerned with flying and its kindred sports, realised the necessity of our youthful generation growing up to understand the importance of the aeroplane, especially from a patriotic standpoint. Not only so, but they saw the necessity for educating the public at large to realise its importance to the nation, and articles were continually appearing with reference to the lack of patriotic interest, the unappreciative attitude towards the possibility of the aeroplane in commerce and warfare.

The man of authority, who already grasped its meaning, urged the people to wake up and consider seriously the matter, to put away once and for all their old sarcastic and sceptical view. Though these appeals were frequently made, the nation's aspect still remained unchanged, and then came the question—which is the best and surest method to bring the people to their senses?

It was then put forward that the medium was through our youths, and really the idea seemed sound, for the novelty and sport of flying had appealed more to them than their elders, and they were taking really a serious interest in the matter. The idea was to form those interested in aviation into clubs and societies to promote and advance the new science by giving exhibitions, meetings, and periodical competitions with the object of attracting the attention of the man in the street.

The youths themselves provided the material, for long enough they had realised the interest and knowledge to be derived from scale model construction. Then came the flying model, and an added charm was given to the pastime, for it was entirely a novelty to construct a machine, to provide it with motive power, and fly it by the same identical scientific principle as its prototype. To enter these in competition with others constructed by fellow enthusiasts was indeed a pleasing prospect, and no sooner was the idea put into practice than it proved an immense success.

Gentlemen prominent in the aviation world were keen to found and aid these societies, and well-known aviators proffered their help, the result being a most satisfactory realisation of the founder's expectations. The clubs thus formed we can, for convenience sake, divide into two sections—(1) those formed by gentlemen who originally propounded the scheme, the said gentlemen kindly attending to the finances of the club, and (2) those formed by independent youths whose sole idea was to bring forward those of their fellows who were interested in aviation for their own edification.

The former we do not need to discuss, for good organisation and management—together with the promoting influence—has placed them on a firm foundation, and up to the present there is no question as to their success. Unlike the second class, they have ample time and money to promote huge meetings, to organise special competitions and exhibitions, and, let it be said, the stupendous list of presidents, vice-presidents, and council (generally occupying the front page of the prospectus) carries a certain amount of weight—all contributing to the success of the organisation.

However, it is to the second class that my opening question alludes, the clubs that rely absolutely upon their own resources for sustenance. It is seldom that one of these societies can organise a successful model meeting. This statement is based on personal experience, the writer having paid numerous visits to the announced flying meetings of these "ordinary clubs," and, except in one instance, the turnout I would not describe as "successful."

The one successful meeting that I was fortunate enough to attend was held in London during last summer, under the auspices of a metropolitan aero club, and it was easily seen that the members had worked whole-heartedly in endeavouring to make the gathering a success. Adjoining the flying ground a seemingly excellent cricket match was in progress, but, as the model-flying commenced, it was astonishing to see the crowd flock into the flying-ground, evidently attracted by the novelty of the proceedings. I heard one fellow casually remark to his neighbour, alluding to the meeting: "This is a deal better than watching yonder match," an opinion heartily corroborated by his friend.

This is the general opinion held by the sensible man, and it must be admitted that these model meetings can do much for aviation by promoting this spirit; though, on the other hand, to announce a meeting which turns out similar to the majority I mention only tends to bring the movement into ridicule.

But why should the average model gathering be a failure? After careful consideration, I come to the conclusion that the *members* themselves are to blame. However well the organisation may be, however perfect and complete the arrangements are, they avail nothing if the members do not back the meeting up by entering models. How ungratifying it must be to the secretary of a club if, after arranging a competition, he finds that his members have not the gratitude and loyalty to back him up. It should be realised by the members that the secretary's work is to manage the affairs of the club and to arrange the various meetings and competitions.

His work is then finished; he is not supposed to make the models, fly the models, be judge, starter, and chief competitor at the same time. Yet this is the ideal secretary of the average member. It must be remembered that the member has his duty to the club to perform, and that is to help the prime mover, with a real earnest help, to make everything attempted a success. When a competition is organised, he must not be content with assuming that Smith, Robinson, and Brown will make the models, for Smith, Robinson, and Brown may be of the same opinion concerning *him*. Do the work *yourselves*, members, and make sure of it.

If the meeting turns out a failure, instead of Smith, Robinson, Brown and Co. bearing the brunt of the failure (and they are really the first ones to complain of the unsuccessful result), the secretary, who perhaps was the only one to have helped the meeting, receives all the blame. The plain fact is that the average youth soon tires of this new pastime. A few breakages soon take all his interest away, and, however keen he may have been at first when the hobby was new to him, he turns sick of continually repairing the work of a side gust or bad landing. Model aeroplane building is no doubt a most entrancing pastime for a youth, but it requires perseverance, pluck, and determination—natural endowments seemingly deficient in our average aero-club member. This opinion may seem most uncalled for and unwarrantable, but I have the opinions of several secretaries whose complaint is the same.

With the hope of doing a little to remedy this distressing state of affairs, I have approached the secretaries of clubs that are now not in existence, and gathered their various opinions as to their failure. If those of my readers who are now members of aero-clubs, upon perusing these lines, decide to put more energy into the clubs' welfare and to back loyally the committees' work, I shall feel that my efforts have not all been in vain.

Correspondence.

The Editor of The Aeroplane *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* The Aeroplane, 166, *Piccadilly, W.*

More about Prevention of Accidents.

Sir,—In view of the fact that a number of accidents have occurred owing to the collapse of some part of an aeroplane it would seem desirable that some steps might be taken to protect both the safety of the aviators and the good name of the makers. In all marine engineering works steam-pipes, expansion joints, tee-pieces, etc., are tested in the presence of the purchasers, superintendent, and an engineer appointed by the Board of Trade, and the parts so tested are, if satisfactory, stamped and passed.

Surely the time has come when aeroplane manufacturers might provide themselves with apparatus similar to that used by Short Bros. for testing struts and ties, and test all important members. In fact, I believe this is usually done. It would be a simple matter for the tests to be made in the presence of a Board of Trade official, who would mark the piece as having been tested satisfactorily up to so many pounds compression, or tension, as the case may be. Similarly planes might be certified to have stood a distributed load of so many tons. It is not necessary for the Board of Trade to specify the loading in question. It is for the designer to decide the necessary factor of safety. In the event, however, of an inquiry into an accident, the maker can produce unimpeachable evidence that the parts were subjected to such and such a test. If those conducting the inquiry consider that the factor of safety was sufficient the maker is relieved from blame.

In a considerable number of cases, more especially in France, accidents have been caused by neglect on the part of those in charge of the machines. Wachter's accident is an instance. If the Antoinette company could have shown that the wings had been certified by the official superintendent to be of a certain strength, it would have been more satisfactory to all concerned, especially to the firm, as, although there is no doubt that the wings were weakened by exposure, there was no official confirmation of the fact.

Moreover, the position of those inquiring into the accident would be more satisfactory, as they would have absolutely reliable data to go upon. J. D. North.

[Mr. North's letter was received after the editorial article at the beginning of this issue had been put into type, and was written without any knowledge of the fact that Messrs. Manning and Flanders had already broached the subject. It, therefore, gives further proof of the trend of opinion among those who are really devoting serious thought to the practical use and proper design of aeroplanes.—Ed.]

From America.

Sir,—You deserve the heartiest congratulations of all constructors for the vigorous campaign you have been conducting in favour of British aeroplanes.

It looks to me, from here, as if the adoption of the principle of having machines built in England was entirely due to your efforts.

My experience of American aviation convinces me that England has far more able aeroplane engineers than this country, and only needs to make it a paying proposition for the higher class designers to go on designing to become the first aviation nation in the world.

If the Government orders are to be handed out to big firms only, or to imitators, of course they would not have this effect, but if they are distributed so that men like Roe, Martin-Handasyde, Flanders, Dunne, Eardley Billing, Jezzi and other small fry can have a chance, it would do so. If it looks like me having a chance you'll see me at it again.

There are about three aviation authorities here equal to any one in England: the Wrights, Zahm, and Charles Manley, late chief assistant to Langley. Curtis is reckoned below these three altogether. The rest appear to be nowhere. The whole aviation crowd are rotten, and I don't think they will accomplish much in the next year or two.

Keep on shouting for a chance for every constructor.

New York. Exile.

Flying in Argentina.

Sir,—Having read in your very interesting paper that certain gentlemen are proposing to start aviation schools in South Africa and Australia, I venture to suggest that it would be well worth the while of some of the English firms at home or some of the independent aviators if they were to give exhibition flights or start schools out here, as they would find a considerable number of pupils to be got; also passenger carrying is, I believe, quite unknown in this country, and I think it would become very popular as well as profitable with a good machine and an experienced pilot.

At present there are only two or three aviators here; Cattaneo is the chief one, and has everything practically his own way; anyhow, he is making his fortune, having annexed various very fat prizes, and still continues to do so.

Personally, though I know very little of aviation I am nevertheless extremely keen on it, and only wish I could indulge in this exceedingly fascinating sport, and I should like to see aviation go ahead out here very much; but up to the present it has not progressed much on account of there being little or no competition. It is a fine country for flying, as there are so few obstructions as compared with the country at home, and it is just as good here as in Australia or South Africa. Generally speaking, aviation here has been met with a very generous hand, as no doubt Cattaneo can testify, and still there are being offered very useful prizes.

Finally, I think it would be to the advantage of any aviator to bear in mind this country when contemplating fresh aerodromes to conquer abroad.

I must apologise for occupying so much space in your paper, which, by the way, in my humble opinion, is a long way ahead of all aviation papers; and wishing you and your paper every success and a prosperous New Year. Argentino.

Cordoba, Argentine Republic, December 3rd.

A Hindoo on Soaring Flight.

Sir,—I have read Mr. Bland's letter "Soaring Flight." It is rather interesting in one way, but when one ponders over the subject one can't help thinking as (I suppose) Mr. Edison would think, or perhaps has thought, that there is enough electricity in the air to lift any article—more so aeroplanes—from the ground, providing an article or substance be found such that no sooner is it by some means exposed or switched on than the air current, being stronger, draws it up (here is a problem for your readers to solve, and produce that substance). The aforesaid article or substance will be more advantageous than the present-day 3 to 6 lbs. per h.p. engines, with propellers.

Of course, the steering must not be forgotten. When the required height is attained, the lifting is detached or switched off and the course (left or right) is switched on, so that that which is lifted may take the desired course. Likewise, when one would want full-speed ahead the side current is cut off and the front put on (or a little left or right inclined).

Advantages (more can be imagined by your worthy readers): No more valve troubles nor petrol getting mixed with drinking water or *vice versa*, nor bolts loose, nor nuts off, etc.

By the way, as this will fly without wings, I propose that it should be put before the War Office of the Barataria Government, and shall be much obliged (if you have any influence) if you would recommend the above type to be thoroughly tested (acceptance of which I doubt). I am sure it will give more satisfaction than the ones the W.O.B.G. have in their hands (if any). And, moreover, they will get the desired results to the T. Of course, hot cross buns will be distributed free on trial days to officers who come to dot the statistics by the Ali Baba Cafair.

Birkenhead. C. M. Seal (of Bengal).

A Question of Stability.

Sir,—I notice that your correspondent, Mr. Winsor (page 717, Vol. I.), asks two questions about the inverted "vee."

If he will take a small piece of paper, weight it in front and then give it a dihedral angle, he will be in a position to answer the first question for himself, as the paper will only glide when the "vee" is upright. It is obvious that lateral tilting will be corrected by the more horizontal half of the wing lifting more than the less horizontal.

With an inverted "vee" instability will be augmented rather than corrected.

With regard to Cody's 1910 machine, the inverted "vee" is very slight, and the main planes must be nearly flat in flight.

If Mr. Winsor has seen a " box-kite " biplane flying he has probably noticed that the wings assume a distinct " vee," owing to the pressure of the air.

I think I am right in saying that Cody adopts the inverted " vee " in order to get increased efficiency by reducing end losses to a minimum.

The excellent control system of this machine would probably account for its apparent stability.

I leave his third question to a better historian than myself.

In his article on the " Plan Form of an Aerofoil," Mr. P. K. Turner states in his fifth paragraph (2nd column) that " the air above the plane has quite as much influence on *lift* as that below it." Surely this is an error for " drift." The one merit of a streamline form supporting surface is that the air follows the upper surface, thus reducing the region of " dead air " which would otherwise be produced. The rectangular tips he advocates have the drawback of producing air eddies and friction, owing to the difference in speed between the air beneath and the air beside the plane.

I notice that he does not allude to the best method of reducing end losses, i.e., bringing the wings back as in the Dunne and Weiss machines.

If the " professional aviator " with whom I had the pleasure of discussing the design of aeroplanes on the Downs on Saturday, December 23rd, will kindly favour me with his address, I shall be pleased to continue the discussion under more propitious circumstances.

Bristol. R. V. TIVY.

[The statement in 5th paragraph was correct. Obviously, if the air follows the upper surface there must be a region of diminished pressure above the plane, which naturally causes lift. Rectangular tips need not, if properly designed, produce air eddies. I did not allude to the Dunne machine as a reducer of end losses, because of all types of plane it is notoriously inefficient.—P. K. T.]

Aeroplane Speedometers.

Sir,—I must apologise to " Jasko " for delaying my reply to his letter, and at the same time, with much regret, accept his statement that he is no mathematician. He has made the mistake of considering the two positions of the aeroplane when travelling round the circle as two aeroplanes, and finding the momentum of the system thus formed. Of course, angular momentum is a vector quantity, and I presume that this is what has led your correspondent to make his extraordinary statements. I expressly stipulated that the basic circle was to be made in a calm, and in that case a circle relative to the wind will also be relative to the ground.

If, however, we consider the change of kinetic energy instead of the change of momentum the problem is much simplified, as, obviously, the change of kinetic energy will mean work done, the work in question being the raising of the c.g. of the pendulum—i.e., imparting to it potential energy.

It is not a difficult matter to find the various velocities of the machine turning in a wind, and by the formula $Ps = \frac{m(v2 - u2)}{2}$ (force + distance = change of kinetic energy) to obtain the data necessary to produce a force-against-angular-distance graph, which might well be used as a foundation for finding the relation between the amplitude of the oscillations of the pendulum and the force and direction of the wind.

I am afraid Mr. Tivy will find instruments of this type of very little use in practice, as the effect of acceleration on the pendulum will not be merely to produce a change of attitude, but to produce oscillations whose amplitude will be relative to rate and magnitude of the change of velocity.

Finally, I would add that this is my last letter on this subject, as the controversy would lead to a dispute as to the laws of elementary dynamics, which is neither profitable to the participants nor interesting to onlookers.

J. D. NORTH.

Some Leading Questions.

Sir,—As one who has only recently taken an active interest in the subject of practical aviation, I should like some information as to the possibility of constructing a small aeroplane suitable for a low-power engine. Questions :—

(1) What is the smallest span compatible with safety for a man-lifting aeroplane?

(2) The lowest power necessary to drive it?

(3) What is the relation between the size of an aeroplane and the h.p. required to lift it—that is, does a small engine necessarily lift a small aeroplane?

I notice in a popular work by Miss Gertrude Bacon, *How Men Fly*, the statement that Mr. A. V. Roe made some successful flights with only a nine h.p. engine. I should be interested to obtain further particulars of this, also what type of machine he used.

It is interesting to note that M. Petit in his book, *How to Build an Aeroplane*, says : " No doubt, in future, flight will be possible with very low-powered motors (3 h.p., or even less), but we firmly believe that the irreducible minimum must be fixed at 105 kilogrammetre-seconds, that is, 2 h.p."

Have any efforts been made in this direction by our inventors or manufacturers? As far as my reading goes the present fashion seems to be the high-power (and consequently more expensive) engine.

May I suggest that when our manufacturers have had their fill of the contemplated Government orders, that they turn their genius in the direcion of producing a small, cheap, machine that would appeal more to the average man than any design at present on the market?

Incidentally, they might find it more profitable.

Westhoughton, Lancs. T. R. WARING.

[Mr. Waring's queries fall distinctly under the category of " leading questions," and are by no means easy to answer.

(1) In my own opinion, about 22 feet, but it is a moot point. I have heard one very clever designer place the minimum at 30 feet.

(2) In my own opinion, 20 h.p. But this necessitates very careful and clever design. A first attempt would be unlikely to fly under 35-40 h.p.

(3) The horse-power varies with the thrust and the speed—i.e., for machines of equal efficiency, with the weight and the speed. Since the *useful* weight comprises only the pilot and fuel, and since the weight of fuel itself varies with the engine-power, the most economical machine is obviously a very small one with a low-power engine, in which case the weights of machine and fuel are small in comparison with the weight of pilot, which, in its turn, means that the horse-power is, as far as possible, devoted to lifting the useful load.

Mr. A. V. Roe succeeded in getting off the ground with a nine h.p. engine for short hope at Lea Marshes in 1908. I believe (I write subject to correction), the machine was a triplane with triplane lifting tail and boat-shaped fuselage.

With regard to M. Petit's idea of three h.p., a little calculation shows that at 60 m.p.h. this will give less than 19 lbs. thrust, say 20 lbs. Assuming that the machine and engine weigh only 100 lbs., so that the total weight, with pilot, is only 300 lbs., that the head resistance is only 5 lbs., and the gliding angle 1 in 20, then the machine would just fly. Personally, I have no hope that these figures will ever be attained. If other readers hold opposed views THE AEROPLANE will be glad to publish them.—P. K. T.]

[Mr. Waring is quite right in his opinion that smaller and cheaper machines will be, ultimately, more profitable than big machines, but the big machines for military work will supply the works equipment which will make the small machine possible.—ED. THE AEROPLANE.]

TOLD IN THE OFFICE.

MR. PERCIVAL was discussing his new machine, which has become known, as was recorded in last week's issue, as *Parseval I.* He finds the machine distinctly tricky as compared to the Billing, on which it was more or less modelled, owing to the fact that he has given up the flaps and put on a warp. The machine is not yet in proper balance, but we hope within the next few days to see Mr. Percival in the air again.

MR. GUSTAV HAMEL said he had had some excellent flying the Saturday before Christmas at Hendon. With Miss Trehawke Davies on the Blériot two-seater, followed by M. Salmet on the single-seater, he went up the Edgware Road, where there happened to be a number of cars at the time. Both the Blériots were naturally considerably faster than the cars, and, flying on each side of the road, where it was possible to land safely in case of an engine stoppage, they had quite an amusing time chasing the cars, which, regardless of speed limits, made strenuous efforts to keep up with them. Afterwards he took Mr. Robert Loraine for a long flight across country, much to the satisfaction of the well-known actor, who said he had never flown in such a steady machine. Mr. Hamel is now anxiously awaiting a spell of fine weather with a northerly or north-westerly wind, so that he and Miss Davies can make their flight to Paris. Their difficulty is that the tanks will not hold enough oil to carry them the whole distance, and though Miss Davies has very pluckily tried the experiment of filling the oil tank from ordinary oil tins while

flying, it is scarcely safe to risk doing so if there should be any wind, so some other method must be devised. The simplest seems to be to fix some kind of pump which will draw oil from an ordinary can and deliver it into the tank. Miss Davies is determined to be the first woman to fly between the two capitals, and The Aeroplane wishes the brave little lady an early fulfilment of her desire.

Mr. Gordon Bell came in to say "good-bye" before going to France to train for the Paris-Pau-with-a-passenger trip, and to order The Aeroplane to be sent to him regularly. He told us that the "accident" reported in the daily papers as having happened to him at Huntingdon on Boxing Day was very much exaggerated. As a matter of fact, he was making a landing with Mr. Jolly, the manager of the Huntingdon ground, as passenger, when a wheel buckled, but no damage was done otherwise. He likes the Radley and Moorhouse two-seater very much, though he had rather an unpleasant experience with it, which ought to be a warning to other aviators. As in the Nieuport and Blériot two-seaters, the passenger sits just behind the pilot, and, consequently, in a machine of the Blériot type, with a lifting tail, more lift must be given to the tail when a passenger is carried, otherwise the machine flies tail down or with a continual push on the *cloche* to keep the elevator down and the tail up. Consequently, when the pilot goes up alone there is too much lift on the tail and too much weight in front. In a trial flight Mr. Bell had gone up alone, and had started to come down when he was hit by a gust, and, as is his custom, dived to keep the machine fully under control. To his surprise the machine refused to bring her head up again, in spite of his having the *cloche* pulled back to its full extent. It was only by switching off the engine that he finally managed to get the tail down and transform the dive into a glide. He quite realised, however, that if he had had a few pounds of lead on the tail to make up for the absent weight of the passenger the machine would have balanced perfectly.

Mr. Petre ("The Painter"), **Mr. Fisher**, and **Mr. H. Petre** ("The Monk"), all just back from the Paris Show, seemed to take a much more cheerful view of things than usual. All agreed that while we can still learn much from French constructors, the best of our aeroplane makers are in no way behind so far as design is concerned. What we can learn are chiefly details of construction, such as any manufacturer can learn from any other in the same line of business in any trade. The visitors seemed to be chiefly impressed by the general all-round improvement in the construction of the French machines, which appear to have levelled up, so that no one machine struck them as obviously better than the others, but all agreed that, given equal capital and equal workshop facilities, the British constructors can do even better work.

Willis' of Hastings.

Messrs. Willis Bros., of Hastings, who have hitherto manufactured the well-known Mann models, advise The Aeroplane that the connection between themselves and Messrs. Mann and Grimmer has been severed by mutual consent, but that they are still supplying the materials, and also sets of parts for machines which have done duration flights of 100 seconds. As was noted recently, their sets of parts have been examined in this office, and it can be safely said that they are excellent value for the money.

A New Constructional Venture.

Following on the success of the Mann model, Messrs. Mann and Grimmer have now blossomed forth as aeronautical engineers, their business address being 15, Arlington Road, Surbiton. Though, for the present, they are devoting the major portion of their time and energy to model work, they intend shortly to construct a full-sized machine in co-operation with another firm, through the medium of which they are prepared to arrange almost any kind of full-sized work. They are also prepared to buy, sell, value and report upon new and second-hand aeroplanes; to arrange passenger flights on any make of machine; to build models for inventors; to give demonstrations with models in any part of the country; or to arrange for demonstrations with full-sized machines.

Although best known in connection with models, Mr. Grimmer has had quite a fair amount of experience of full-size work, and has been for years a close student of aviation. He is a most conscientious worker, and has the cause of aviation sincerely at heart. Mr. Mann, though young to engage in a business career, possesses very considerable ingenuity, and has obviously the makings of a very capable designer, so that the new firm ought, with any luck, to be quite successful.

CLUB NOTES.

N.B.—Club Notes must be posted to 166, Piccadilly, to arrive not later than first post Monday morning, and should be as brief as possible.

The Reigate, Redhill, and District Aero Club.—Demonstration arranged for Boxing Day had to be abandoned, owing to weather, but members turned out on Christmas Day, and there was good flying. Club's chairman, Mr. W. H. Norton, brought out P—1—1 model, which shows promise; Lewis, as usual, getting fine flights with Weiss-type model, obtaining 200 to 250 yds. Wilson brought out 1—1—P2 model and got 250 yds. straight line flights. Four members have commenced building glider. On Wednesday, December 27th, Lewis out making flights of 250 yds.; also Wilson took out his new "climber," and got over 70 ft., descending with splendid *vol plané*. Prospective members should write to—H. V. May, Hon. Sec., 4, London Road, Reigate.

Brighton and District Model Aero Club., 36, Little Preston Street.—Excellent afternoon at Shoreham on Saturday Bate, Armstrong, Hervey, White Knowles. Von Wichmann and Burghope all flying well. Open point-to-point races, Saturday, January 13th. General meeting, Saturday next (6th), at 7.45 p.m. Flying as usual at Shoreham. Members should tune up models for competition. Competitors and new members apply—A. Von Wichmann. Hon. Sec., "Kingsleigh," Kingsway, Hove.

Smithills (Bolton) Aero Club.—Several models turned out on Saturday. Gliding experiments with Farman-type model were carried out—and a rising-off-the-ground model successfully tested. More members are needed, and secretary will be pleased to forward particulars.—J. Scott-Taggart, (Hon. Sec.). "Lieutenants," Smithills, Bolton.

Bristol Model Flying.—Meeting on December 20th. Chairman read terms of affiliation to Kite and Model Aeroplane Assn. Decided that no further steps could be taken until formal proposal made at committee meeting of Bristol and West of England Aero Club to form Model Section. All present agreed to join at subscription suggested. Cbairman made remarks on "Stability versus Effieiency." Edgar and Haines spoke on "Landing Cbassis" and "British Military Competition." Model flying on Downs (Sea Walls) every Saturday at 3 15 p.m. until further notice. Model flyers advised to bring note books and take notes of experiments.—R. V. Tivy, Hon. Sec.

Blackheath Aero Club.—December 25th and 26th, Dollittle, Brough and Whitworth competed for best flight with a "tractor" model. Dollittle's "Gnat" monoplane won with 318 ft. 30th, at Kidbrooke, For i obtained Second Class Certificate with 287 yds., and Brough, flying 4 oz. "Victor" at Blackheath, got First Class ticket with 1,524 feet. At Lee, Plummer, Woolard, Pizey, Egelstaff and Holland were flying, and former won Second Class Certificate with "Meteor" monoplane. Plummer's model greatly admired on account of steady flying and great heights attained. Open Competition at Kidbrooke, January 13th, at 2 p.m., for Distance, Duration, and Steering—marks given in eacb event, and J. H. Dollittle, Esq. will present miniature silver cup to constructor of model gaining higbest total marks. Particulars from A. B. Clark, Hon. Sec., 196, Brockley Road, Brockley, S.E.

Birmingham Aero Club.—Not much doing at Billesley Farm during holidays owing to weather, but slight improvement last week end. Trykle got flights of about 300 yds., Lunn again getting good results, and towards dusk gave exhibition with model minns motor, gliding from roof of shed. Fine glides obtained, gliding angle being over 1 in 7. Master Stamps' model very good flights finishing with splendid glides. A. S. McManus' monoplane with high aspect ratio doing fast flights of about 1,000 feet.—G. Haddon Wood, Hon. Sec.

Conisborough and District Aeroplane Society.—On 30tb, distance and duration records handsomely beaten by Allport. New records are now 1,163 ft. and 55 seconds. These flights performed in dead calm, and measured in straight line from starting to landing point. Distance covered some where about 3,000 ft. as model actually flew in semi-circle. Duration timed as long as model could be seen, and calculated by distance to have flown several seconds longer. Model was twin-propeller, single stick, 4 ft, long, 9" propellors of 28" pitch, and weighed 7 ozs.—J. E. Greathead, Assistant Sec.

Eastbourne Model Club.—Aero Club is about to be formed. Anyone interested asked to write to—V. Yates, at St. Anthony's Avenue, Seaside.

An Edinburgh Aero Club.—It is proposed to form an aero club in Edinburgh All interested should write to—D. Urquhart, Esq., c/o Mrs. Campbell, 127, Lothian Road, Edinburgh, who is Hon. Sec. (*pro tem.*) The club will have the advantage of the immediate use of a completed glider, which has already flown successfully, so that it will be able to start operations at once.

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THE AEROPLANE

1D WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

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OUR AERIAL DEFENCE FORCE.

The six officers who appear above constitute the whole of Great Britain's Aerial Defence Force at the present moment, as represented by the Aeroplane Company of the Air Battalion, R.E. In the centre is Captain J. D. B. Fulton, R.F.A., commanding the Aeroplane Company. Above are Lieuts. D. G. Conner, R.F.A., and H. R. P. Reynolds, R.E. Below them Lieuts. G. J. E. Manisty, 67th Punjabis (attached), and B. H. Barrington-Kennett, Grenadier Guards. At the bottom is Lieut. G. B. Hynes, R.G.A.

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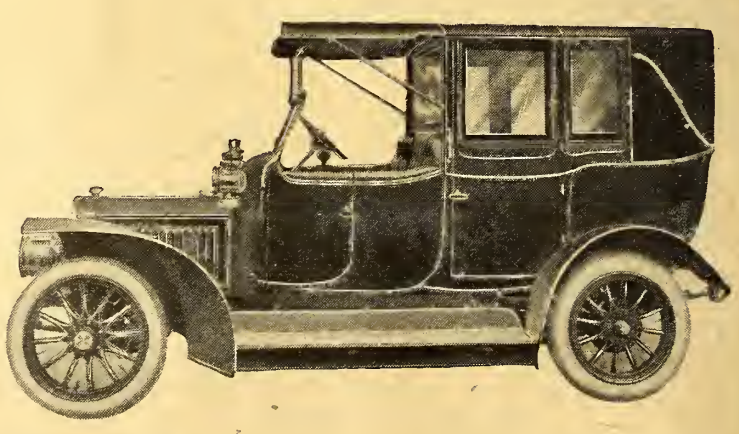

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Stealing a March.

Now that Parliament is not sitting and no awkward questions can be asked in the House, the Sapper "clique" at the War Office has apparently made up its mind to seize its chance and do as much harm as it can to the development of a proper scheme of aerial defence.

The circular quoted last week as having been sent out by the Director of Personal Services at the War Office to Engineer officers (a circular which amounts in effect to an advertisement for commissioned "recruits" to the Air Battalion) has undoubtedly stirred up an immense amount of interest, and, be it said, ill-feeling among officers in other branches of the Service who are interested in aviation. The thing is undoubtedly part of a regular plot to make the Air Battalion permanently an Engineer unit, and to keep for the Sappers the well paid and interesting posts which are certain to come into existence.

The Great Scheme.

Having a certain amount of knowledge of what is going on inside, the writer has no hesitation in stating definately that this scheme is the pet idea of the staff at the headquarters of the Air Battalion which is stationed at Farnborough and consists entirely of Engineer officers. Some of the steps which have already been taken towards the realisation of this scheme are worthy of note.

First, one learns that a young officer of Engineers has been appointed direct from the School of Engineering at Chatham to the Air Battalion. This appears to the writer to be a direct contravention of the Army Order which called the Air Battalion into existence, an order which laid down amongst the conditions of appointment that officers appointed to the Air Battalion must be in possession of an aeroplane pilot's certificate. An appointment of this kind is a glaring injustice to those officers of other regiments who have gone to the trouble of acquiring aviators' certificates at their own expense, and who are at present on the "waiting list" hoping for appointment to the Air Battalion.

The attitude of Engineer officers in general towards this pet scheme may be judged from the fact that it has been necessary to appoint an officer who has not yet completed his course of instruction at Chatham, because there has not been one single applicant for appointment to the Air Battalion, either with or without a certificate, from among the officers of the Royal Engineers.

A Futile Excuse.

Apparently, the excuse for such appointments is that the rank and file of the Air Battalion being Sappers, a proportion of Engineer officers is required for administrative work, but it seems almost impossible to reconcile that view with the fact that officers from other branches of the Service such as Captain Maitland, Captain Fulton, Captain Burke, Lieutenant Barrington-Kennett, Lieutenant Conner, and others have been appointed to the Air Battalion, and possess administrative and disciplinary control of the men of the Royal Engineers, who, by the way, are thoroughly exce lent men from all points of view.

Another step in the scheme is shown by the fact that Lieutenant Fox, R.E., of the Balloon Company of the Air Battalion, has recently been learning to fly on Salisbury Plain at the Government expense, while officers in every other branch of the Service, who have had to learn at their own expense, are continually being refused when they apply to be appointed or attached to the Air Battalion, in spite of the fact that there are only five officer-aviators at work and about eight or nine machines for them to fly.

It can easily be seen, therefore, that by the process of appointing Engineer officers without any experience to the Air Battalion, and then teaching them to fly at the Government expense, it is possible completely to convert the Air Battalion into an Engineer unit.

The Enterprise of the Engineer.

Whether this can be for the good of Army aviation may best be judged by the following facts.

First, there is not, apparently, a single Engineer officer desirous of appointment to the Air Battalion, otherwise it would not have been necessary to advertise for them in the manner shown in the paragraph mentioned above, which has appeared in various papers.

Secondly, no Engineer officer is in possession of an aeroplane pilot's certificate obtained at his own expense with the single exception of Lieutenant Beattie, R.E., who has not, up to the present, shown any particular desire to join the Air Battalion.

Thirdy, neither the Commandant of the Air Battalion, who is only a major, and young at that, nor the officer officially designated as Instructor, who is a captain, have taken the trouble to secure an aeroplane pilot's certificate, nor have either of them ever attempted to fly an aeroplane, though they naturally have a free hand with all the Army machines. And this in spite of the fact that the young major and the captain in question have before them the examples of Brigadier-General Henderson and Colonel Smeaton, both very much senior officers, who have had the pluck and initiative to qualify as pilot-aviators at their own expense, so that on active

service they may have practical knowledge of what they can with certainty demand from their air scouts.

And all this beautiful scheme, if you please, emanates from the unit which is advertising for more Engineer officers to join it. They may well say that pilots' certificates are not necessary. The fact of the matter is, as has been stated before in these columns, that, with a few honourable exceptions, the Engineer officer is neither a sportsman nor a fighting man, and by nature and training he is utterly unfit to be an army aviator or to have control over army aviators. As for the method adopted to forward the scheme it can only be compared with the famous, or rather infamous, circular sent round some time ago asking commanding officers of regiments whether they could recommend officers with considerable private means for special staff duties, money and not brains, apparently, being desired. Enough trouble was raised over that circular to do a considerable amount of good to the Service, and it is only to be hoped that a similar agitation will be aroused by this piece of questionable business.

On the Selection of Officers for the Air Battalion.

By W. F. de B. WHITTAKER.

In the British Army there has been up to the present a number of well-defined rules regulating the selection of officers for special service of any kind. Further, the initial appointment of officers to regiments follows set lines, ordained both by regulation and custom. It is, therefore, a little surprising to read in the public prints an inspired statement that the Director of Personal Services at the War Office is inquiring from General Officers commanding districts as to what officers of the Royal Engineers are desirous of becoming attached to the Air Battalion.

No clear definition of their course of training or ultimate duties is laid down, but it is announced that the possession of a pilot-aviator's certificate is unnecessary. The almost entire absence of pilots in the sappers is probably a sufficient explanation of this clause. Aviation has from the beginning been treated with utter disdain by the Royal Engineers, the very section of the Army which, if really efficient, would naturally take most interest in the subject, at least in so far as the scientific side is concerned.

In effect they have put every possible obstacle in the way, and it is therefore surprising to find that, immediately following the dawning of intelligence in the headquarters staff of the Army—as shown in the recent promise of expansion in our aerial force—the future of the air corps should practically be placed in the hands of those who are in essence its executioners.

If, on the other hand, one accepts the position that the War Office have really the interests of Army aviation at heart, and imagine that the course pursued is to the ultimate good of that section, one fails to see why they do not make use of the services of some of the officers already possessing aviator's certificates. The number actually available is over thirty (two only being sappers), none of whom received Government aid whilst learning to fly.

At first sight it would seem natural to employ sappers on a service to superficial appearance so intimately connected with engineering. On this same reasoning, use might be made of officials from the Army Clothing Factory, who have a deep knowledge of fabrics, or of such officials as undertake the construction of furniture such as is liberally supplied by the Government to officers living in barracks.

The duty of officer-pilots is to fly on matters of reconnaisance, etc., and not to tune up engines or construct fuselages. An officer desirous of being gazetted to a cavalry regiment is not expected to have an intricate knowledge of the diseases of horses or to be an expert farrier. Nor is it customary to invite veterinary surgeons to accept commissions in the cavalry. Why, therefore, give favourable selection for posts in the Air Battalion to officers the greater part of whose time has been spent in supervising the scratching of holes in the ground?

The staff of the Aircraft Factory is also made up on strange lines. Here, if anywhere, would the Royal Engineers be of use. In actual matters of construction, such as is necessary in the repair of Army aeroplanes and in the tuning of engines, they would be of the greatest service.

The employment of civilians in matters intimately concerning the Army cannot be too greatly deprecated. They are not conversant with the ordinary routine of Army life, and their official presence in any camp or garrison is only provocative of quarrels and general ill-will. In any case there are as clever brains in the Army as ever stayed out of it.

As to the designing of machines, that can be safely left to the manufacturers. The duties of the Aircraft Factory, which should be controlled by the Royal Engineers, should be merely the repair of aeroplanes and engines, and the establishment, by further experimentation, of the proof of the utter uselessness of dirigible balloons. For this work the sappers would be admirable. At least the officer commanding in such an event would not be guilty of the bad taste of communicating to the London Press his own opinions of what he imagines to be his own achievements in the building of an aeroplane which was actually built with this country's money and from other countries' designs.

Before any large purchase of machines is made, the Air Battalion should be reorganised and placed on a workmanlike footing. The staff of the Battalion ought to be selected from officers who show particular aptitude for the work, and have taken their pilot's certificates. Their appointments should be permanent, and not merely for a period after which they return to their former regiments.

It ought to be possible shortly to gazette men direct from Sandhurst or Woolwich, if only to a limited extent. In addition to this regular staff, officers can be attached for service for instruction and refresher courses. It is probable that at some future date each regiment of foot will have attached to it an aeroplane, as is intended in certain foreign armies.

The rank and file of the Air Battalion should be either recruited direct or be supplied from the Royal Engineers. Not only must the corps be organised, but the duties must be clearly defined.

Under war conditions, it is obvious that the Air Battalion would not be used *en bloc,* but would be divided sectionally. Therefore the number of companies should be elastic and each company should be a self-contained unit, complete in itself as to officers, men, aeroplanes, wireless installations, motor trucks (for conveyance of aeroplanes), etc. The captain commanding in each company should be responsible for his company's efficiency to the colonel commanding. When in the field he would in the ordinary way be under his brigade commander.

A certain number of difficulties and problems are certain to arise whilst the air corps is in process of formation, but experience will rapidly show the mistakes, which can then be eliminated. The improvements taking place continually in aeroplanes will, of course, alter and extend the duties of the Air Battalion. But if the Battalion be properly organised, the new duties could be grafted on without any serious change.

Taking all things into account, the new method of "recruiting" for the Air Battalion on the part of the War Office cannot be too greatly condemned.

Army Competition Conditions.

The following letter has been received by the Secretary of the Aeronautical Society from the War Office:—

"Sir,—With reference to your letter, dated 19th ult., inquiring as to the correct interpretation of condition No. 13 of the specification for a military aeroplane, I am directed to inform you that the intention of the condition is that the pilot must be able to start his engine and get under way without aid of any kind from assistants. I am, Sir, your obedient servant,—E. C. Seaman, Major R.E. (for Director of Fortifications and Works)."

In the statement issued by the War Office on the 14th ult., the offer of two sets of prizes was announced: (*a*) Prizes open to the world for aeroplanes made in any country; (*b*) prizes open to British subjects for aeroplanes manufactured wholly in Great Britain, except the engines.

The Secretary of the War Office announces that in the above statement the expression "Great Britain" was inadvertently used for "the United Kingdom." This will be comforting to Irish aeroplane constructors, who will now realise that they may compete.

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AIR CURRENTS.

ELOQUENT SILENCE.

The following article is from the *Daily Telegraph* of January 3rd, the interpolated remarks are not :—

"On Monday and yesterday trials were made at Aldershot of a new type [*sic*] of aeroplane, which has been constructed at the Army aircraft factory. The chief features of the new machine comprise automatic warping to maintain balance, automatic starting, enabling the pilot to get away unaided [*Is this by, with, or from the machine—free will or predestination?*], a propeller of a four-bladed pattern fitted in front of the machine, and a noiseless flight secured by a system of silencers on the engine. The machine is a biplane of Farman appearance, the pilot's and passenger's seats being behind the engines, which enables only side observations to be made. [*In a machine "of Farman appearance" with the engine in front one would expect something quaint in the observer's observations. But how does the pilot see to steer?*]

"Mr. G. De Haviland has been carrying out the experimental flights which have been watched by all the experts of the Air Battalion with great interest. [*All the officers entitled to the adjective being on Salisbury Plain, doubtless the "Factory" had arranged for television.*] Several of the experts have been taken up as passengers, and it is said that all are much impressed with the possibilities of the machine. [*"Toujours la politesse"—being guests.*]

"Interviewed by a Press representative, Mr. Mervyn O'Gorman, superintendent of the aircraft factory, who was himself a passenger during the test, modestly alluded to the achievement as 'a little step in advance.' [*Surely the achievement of taking a "factory" official as passenger on a "factory" machine is more than a "little step."*] He proceeded: 'It is, as regards every stick and fibre of its being, English, including the engine, which is a Wolseley. [*How much then is original Voisin, out of which "The Times" announced it to have been constructed?*] As far as I know, this is the first absolutely silent aeroplane [*Doubtless the silenced Howard-Wright appeared too long ago to come within the cognisance of "factory" knowledge*]; it is silent to this extent—that when the wind is blowing strongly from it towards you, you cannot hear it. A military aviator, who was present, remarked that there were other machines with which he was acquainted in which it would not have been safe to have ascended in the wind that was blowing. [*But then, some people are acquainted with machines in which it is unsafe to ascend in a calm.*] As a matter of fact, silence is very easy to attain, and I see no reason why every aeroplane which does not employ a rotary engine should not be silent. It is a very simple matter. The reason why it has been put in the background hitherto is because other matters have required more attention, but everyone knew that the moment for silence could be given—at all events on a large class of engines. [*Why only momentary? Continuous silence seems preferable.*]

"'There is a certain loss of power in silencing [*Quite true, And lack of silence has been the makings of some*], but there is no difficulty about it beyond just a careful study of the engine proposition. People are afraid of aeronautics, but when the aeroplane is flying frequently from town to town silence will be imperative. You can imagine, for example, that it might be worth a man's while, instead of taking a special train, to be carried along what might be called the postal route between Dover and Liverpool. He comes from the Continent and wants to get to America [*There is no accounting for tastes*], and on such a route as that silence would before long become compulsory. [*Picture the silence of a transatlantic aeroplane full of Americans.*] The extent to which the weather delays or controls the doings of an aviator depends largely on two things: one, the speed of his machine. The greater the speed, the less is he affected by the relative fluctuations in the speed of the wind. The other thing is that his means of control of his balance shall be very powerful in response to a small effort on his part, that by making a small effort he shall obtain a large result.' [*Just as the small efforts of the "factory"—only costing some few thousand pounds—have produced this epoch-making machine.*]

"Mr. O'Gorman remarked that technical points regarding the machine which constructors of English aeroplanes for military or naval purposes might desire to know would, as far as possible, be placed at their disposal. [The Aeroplane *is contemplating the organisation of special trips for aeroplane constructors to Farnborough from Eastchurch, Erith, Brooklands, Hendon, Leeds, Manchester, Huntingdon, Bristol, and elsewhere.*] It was improbable that a fleet of these new aircraft would be built by the Government, because the authorities wished to encourage private construction." ["*For this relief much thanks.*"]

NO PREVIOUS EXPERIENCE NECESSARY.

Inspired by the recent advertisement in *The Times* and elsewhere asking for R.E. officers to do aeronautical work, and intimating that the possession of a pilot's certificate is not necessary, here are a few more suggestions for advertisements which might come from our brilliant Government Departments :—

WALK UP! Walk Up!—Entries can now be received for the great London to Brighton Army Test Walk. Preference given to one-legged men, whose mathematical training has taught them how to dot and carry one.

OWING to the slackness of recruiting, the Secretary of State for War requires immediately 5,000 men to join the Cavalry. Special consideration given to old-age pensioners who have experience of equilibration, if not of equitation.

Situations Vacant.

ARMY DIRIGIBLE SALVAGE CORPS requires Chauffeurs for new high-powered motor transport cars. Previous experience of motor-cars not essential, but applicants must be members of the "Royal Foozlers' Barrack Building Association."

Situations Required.

LADY A. B. recommends James Brown, her pantry-boy, as Stud-Groom, or to take responsible post in Army Remount Establishment. He knows nothing of horses, but is thoroughly honest, sober, and reliable, and has shown considerable aptitude at cleaning grates and in taking toy Pomeranians out for exercise.

Financial.

THE COLLAPSIBLE VEHICLE BATTALION, having recently acquired several old gas-vessels, are willing to take in Premium Pupils. Such pupils will be afforded a very occasional opportunity of witnessing short experimental trips—or rips. No applications can, under any circumstances, be considered from anyone who has previously displayed any interest or knowledge of the work. The directors think it patriotic to point out that their business is conducted solely with a view to amusing the British public, and not with any scientific intent.

To Amelia—A Protest.

"Airwomen."

"Poor Amelia! She would faint once more at the statement that 'in 1903 it became imperative for lady motorists to have a club of their own,' and that there are enough women aviators to form a 'Women's Aerial League.'

"In our grandmothers' day the only genteel occupation for penniless gentlewomen was that of private governess."

Amelia is a friend of mine, and I
Am rather careful how I pick and choose,
Imagine then my consternation when
I read this item in the *Evening News*.
Amelia was, I thought, strong-minded, and
I had screwed up my courage just to say
I hoped she'd join me in a jaunt I'd planned
To fly across the Herring Pond one day.
But—if Amelia faints on hearing things
I find quite normal, well, it can't be did—
A fainting female in an aeroplane!
I wouldn't risk it for a hundred quid.
I thought upon my transatlantic flight
She would be useful—(What are females for?)
To keep the warming apparatus right,
And give me Bovril through a festive straw.
And then, of course, she could attend to things
I had no time for. She'd have lots of fun
Shooting promiscuous albatrosses dead,
And warding sharks off with a hefty gun.
But stay, this sudden weakness on the part
Of my Amelia I may thus explain,
The term "airwomen" so upset her heart
That she collapsed beneath the horrid strain.

D. M. H.

The Weak Point of the French Air Corps.

By W. E. de B. WHITTAKER.

It is a platitude that one ought not to base one's judgments on appearances, but it is a platitude that is all too frequently ignored. A man of the most saintly aspect, whose chief apparent joy is the reforming of criminals and the writing of sacred music, may at the same time be in reality a poisoner of diabolic ingenuity. Cities of the East, viewed from a distance, are of celestial beauty, but a closer acquaintance reveals a sink of corruption. And so in almost every condition of life, reality wears a mask.

In the advancement of aviation France has taken a leading place from practically the beginning, and the support given to the new science by the French War Office has much to do with the rapid progress made in the last two years.

Leaving aside the performances of civilians, the exploits of the different French military aviators and the purchases of large quantities of aeroplanes by the Government have caused other less progressive countries to make efforts to form effective aerial fleets. The world looks on with admiration at the supposed perfection of organisation in the French aerial corps. And yet, though that corps is supplied liberally with money, and neither men nor machines are lacking, the organisation is of the worst possible description, and matters are going from bad to worse.

In England we have the organisation, but no machines, whilst in France they have everything that can be required, save that one essential—organisation. The supreme authorities, while they have decided that flying is of incalculable use in a modern army, have not yet made up their minds as to what precisely that use is to be, and consequently money is spent freely, but to no good purpose.

On paper all is well. The official reports speak highly and at great length of the condition and conduct of the "fourth arm." But private information from officer-aviators and others tells a very different tale.

In the first place, the aerial service suffers greatly from lack of definition of authority. A subaltern-aviator actually attached to the air corps is liable to be detached from that service at a moment's notice at the command of any officer senior in rank, even though that officer has nothing to do with the new science. Unless the aviator is on some specific duty, such as a flight round a circuit of aviation camps, he is never free from the fear of interference from outside sources. This state of things ought to be immediately altered. It is, at the same, a warning to the British service. Such things are likely to happen over here.

Further, a list of the French camps of aviation is quite imposing to read, but the greater number only exist on paper. A few ramshackle sheds may exist in each place specified, but they are rarely used, and are certainly not deserving to rank with the great camps at Etampes and Reims, though officially little distinction is made.

These principal training grounds are themselves in quite a bad condition. To take the case of Etampes, the state of affairs seems to be particularly shameful. There are over 100 officer-aviators and pupils stationed at the camp who have to reside in Etampes itself and travel out daily to the flying ground at Ville Sauvage—quite six kilometres out of the town. The aerodrome has been allowed by official negligence to deteriorate until it is certainly not fit for experimental flying on the part of pupils. The sheds, of which the greater number are of canvas, are rotten and sodden with rain. The state of the machines housed in these hangars may well be imagined. All the steel portions of the aeroplanes are covered with rust, the canvas rots and the wood warps, and nothing is done to improve matters. The ground immediately outside the hangars is a morass, and no attempt is made to drain it properly.

As to the conditions of work they are quite as bad. Workmen, expert in the maintenance of engines, receive from the Government eight francs a day in place of thirteen francs which they would receive from almost any ordinary employer. The sappers attached for aviation work on an average ten hours a day. Their food, which they receive at irregular intervals, is meagre and not always fit to eat. Finally, no effort is made to supply them with suitable sleeping accommodation, and they are left to make shift as best they can with bivouac bags on the floors of the sheds, frequently with the rain pouring in torrents through the holes in the roof. On other aerodromes the conditions are but little better.

The selection of sites for flying grounds is also weak. An aviation camp has been opened at great expense on the borders of the Auvergne on a surface so bad that an aeroplane rarely makes a landing without a smash. Our own aerodrome at Farnborough is but little worse.

Contradictory orders are frequent, and there seems to be no officer with authority to receive and allocate machines. A few weeks ago three biplanes, fitted with Gnôme engines, were delivered at one of the State aerodromes. An order, presumably from Paris, was received to dismantle the engines, but no further instructions were given. Consequently three biplanes are standing useless in the sheds with three Gnôme engines placed near them, but not in them, and equally useless. Red tape is apparently not unknown in France, and inefficiency is not the prerogative of the British War Office.

As is the case with any aerodrome a great number of aeroplane cases are stacked near the hangars. Recently, in a moment of ennui, someone proceeded to examine the interior of the cases, and to his amazement discovered a new aeroplane, which had apparently been lying unopened for months.

AN AERIAL REVIEW.—This clever design is taken from a Christmas card received by "The Aeroplane" from Mr. Richard Gates, of the Hendon Aerodrome, and gives an excellent idea of the types of machines most popular to-day.

An army may possess innumerable aeroplanes, but under treatment of this sort they cannot be of great use. New aeroplanes are lying unused whilst officers like Lieut. Lanthcaume go to their deaths on machines of which the condition is disgraceful through criminal neglect on the part of the French General Staff.

It is not lack of money which brings about this state of affairs. It is the lack of a responsible officer in supreme control of the fourth arm, and answerable to the general officer commanding-in-chief for the efficiency of his command.

It should not be in the power of an officer commanding a district to interfere with the general policy of the air corps. The military uses of the aeroplane should be laid down on broad lines and a general scheme should be adhered to rigidly until headquarters find any change desirable. A change of plans, whether good or bad, should affect all and not merely a section of the force. Questions of military discipline, of course, will always be dealt with in the usual way.

As soon as possible officers should be gazetted direct to the air corps from military colleges, and not be merely attached from other units.

In the case of accidents, rigid inquiry should take place, and if negligence be proved punishment should be inflicted on the officer deemed responsible. In no other way can the safe condition of the military aeroplane be ensured.

The makers' comments on their own machines when in the form of warnings ought to be duly considered. If a manufacturer only guarantees his work for a limited period one may be perfectly sure that period will not be under estimated, and after the lapse of the guarantee a careful examination ought to be made.

One manufacturer, who has supplied a large number of monoplanes to the French Government, will only answer for the constructional safety of his wings for a period of two months after delivery; that is, two months of fairly hard work. Despite this, several of these machines have been flying unexamined for over twelve months. Is it to be wondered at that accidents happen occasionally from the collapse of wings?

These remarks apply equally to England. As our officers learn to fly at their own expense, and then, though employed for the specific purpose of flying, frequently have no machines to fly, they are reasonably safe from fatal accidents. But a time will come, and probably quite soon, when the Government will really acquire certain useful aeroplanes.

It is advisable, therefore, before launching out on a large scale, to frame regulations which, without being grandmotherly, will be a reasonable safeguard against accidents. Also opportunity should be taken to so organise the force that it will have opportunities of becoming highly efficient and of expanding easily.

Our Air Battalion must be as capable in its knowledge of the practice of aviation as are the gunners in the manipulation of their guns and the sappers in the designing and digging of drains.

A Military Designer.

The French Ministry of War, though not intending to construct aeroplanes for use in the "fourth arm," are apparently not averse to spending money on the carrying out of designs drawn up by officer-aviators who have shown promise. Lieut. Blard, who last year made a prolonged tour of the military camps of aviation on a Farman biplane (non-lifting tail type), accompanied by a passenger, has been granted three months' leave of absence that he may design and build a monoplane in the Government Aeronautical Laboratory at Chalais-Meudon. As this monoplane is to be of the tail-foremost type, the results of his experiments will be watched with interest.

One hopes that he will be more fortunate in his efforts than Captain Lucas Gérardville, one of the three first pupils of Wilbur Wright, who has spent the last two years at Chalais-Meudon also endeavouring to design an aeroplane, but with no apparent success, though he himself has received a step in rank.

The manufacturers in France are so well supplied with orders by the Government that they view with unruffled equanimity any aerial experiments carried out at the Army's expense. They are not in least worried at the prospect of the Government constructing largely on its own account. To-day is very pleasant to them, and to-morrow has no terrors.

The Royal Aero Club.

Attention is drawn to the Army and Navy aviation prizes of £1,000, presented by Mr. A. Mortimer Singer, and the British Empire Michelin Cup, No. 2, £600. The gist of the rules is as follows:—

Mr. A. Mortimer Singer has presented to the Royal Aero Club the sum of £1,000 for competition by commissioned officers in his Majesty's Regular Army, the Royal Navy, and the Royal Marines, on the active list. The prize will be divided as follows: Army, £500; Navy and Marines, £500.

The winner to be the officer who, accompanied by a passenger, also in the Regular Service (combined net weight to be not less than 20 stone), starting from any recognised flying-ground or other starting-point sanctioned by the Royal Aero Club, makes the longest cross-country flight out and back between April 1st, 1911, and March 31st, 1912, both days inclusive. The flight must be confined to the British Isles.

The flight shall be out and back, and the distance from the starting-point to the turning-point, measured in a straight line, shall be not less than 10 miles or more than 50 miles. A competitor may repeat his out and back flight any number of times without alighting, and in order to arrive at the total distance covered only the completed circuits will be taken into account. The distance covered will be measured in a straight line between the two points on an Ordnance Survey map. The turning-point must be a fixed object, selected and declared by the competitor to the observers of the flight.

Officers wishing to compete must send in their names to the Royal Aero Club, 166, Piccadilly, London, W., together with an entrance fee of 20s., after which they are at liberty to start at any time they please, subject to the necessary arrangements for observers having been made.

The Michelin Tyre Company has presented to the Royal Aero Club of the United Kingdom, for competition by British aviators, the sum of £600, to which will be added a trophy to be retained by the winner.

The winner for the year 1912 shall be the competitor who, on October 15th, 1912, shall have completed a prescribed circuit of about 186 miles on an aeroplane in flight in the fastest time, reckoned in miles per hour.

Competitors may select their own circuit of about 186 miles, but the start must be made from a flying-ground approved by the Royal Aero Club, and the proposed circuit must be submitted to the Royal Aero Club before the flight is made.

The complete circuit must be accomplished without alighting.

A number must be prominently displayed on the aeroplane in places approved by the officials, and when flying round each of the points selected in the circuit the aviator must fly sufficiently low so that his number may be easily verified by the official observer.

The circuit must be completed between the hours of sunrise and sunset on any one day.

The entrant, who must be the person operating the machine, must be a British subject, flying on a British-made aeroplane, must hold an aviator's certificate and must be duly entered on the competitors' register of the Royal Aero Club.

The complete machine and all its parts must have been entirely constructed within the confines of the British Empire, but this provision shall not be held to apply to raw material.

An entrance fee of £1 must accompany every notification of an attempt, and at least three clear days' notice must be given to the Secretary, Royal Aero Club, 166, Piccadilly, London, W. A competitor must further deposit a sum of £10 on account of expenses, if any, of observers. Any balance not so expended will be returned to the competitor.

The Atlantic Flight.

It is reported from the United States of America that, in addition to Mr. Martin's scheme, which was first announced in The Aeroplane, an attempt is to be made to cross the Atlantic by Mr. Harry Atwood, who distinguished himself last year by a flight from St. Louis to New York in unfavourable weather.

He has ordered a hydro-aeroplane of new design, which is expected to attain a speed of over eighty miles an hour. At this speed he estimates the time occupied in flying from Newfoundland to the West Coast of Ireland will be thirty hours. He will start at about eight o'clock some evening in April, and he intends to follow the mail route. His mechanic will accompany him. The only details of construction at present mentioned are that his machine will have two propellers driven by a 150 h.p. engine. The distance to be covered is put down as 2,450 miles. That is to say, he expects to maintain a constant speed of at least eighty miles an hour, carrying sufficient fuel for a 150 h.p. motor. It seems scarcely within the region of probability under present conditions.

A Method of Comparing Efficiency.

By P. K. TURNER.

The efficiency of an aeroplane is concerned with three factors: weight, speed, and horse-power. It is important that a student of the subject should remember that in any machine there are several efficiencies, a large range of speeds, various weights, and at least two distinct maxima of horse-power, so that these terms need careful consideration.

First as to efficiencies: we have the efficiency of the planes as weight carriers at a given speed, efficiency in lift-drift ratio, efficiency of the whole machine as a weight-lifting contrivance, and other varieties. I am taking in this article the efficiency entirely from the practical point of view. With this object I propose to take as my weight the actual "live load"—i.e., the weight of passengers or goods carried, excluding even the weight of fuel used; for the aim of a designer is to *increase* the possible live load while *diminishing* the weight of machine, fuel, and oil.

The horse-power is that given by the engine: for, although it may be justly contended that the power which drives the machine is the power given out by the propeller, it must be remembered that the power which, by its consumption of fuel, limits the radius of action is the power given by the engine

The speed of the machine is that sustained (in calm air, of course) in horizontal flight when using the stated horse-power. I express it in this manner for the following reason: a machine with a reserve of power may be rated as of, say, either 60 or 80 horse-power. At full speed, perhaps, it will fly at 70 m.p.h., this will fall to 55 m.p.h. at 60 horse-power. It would obviously stultify the reasoning if the efficiency were calculated on the basis of 70 m.p.h. with 60 h.p., or *vice versa*.

What Efficiency Means.

In order to get a proper understanding of the meaning of "efficiency," it is necessary to understand thoroughly the meaning of horse-power and work done. Work is done by moving a force through a distance. If, for example, I place my foot in the pit of an opponent's stomach and push him steadily backwards for ten feet, and if I ascertain that his passive resistance to this movement is 55 lbs., then the work I do is 550 ft.-lbs.

Power is the *rate of doing work*, or, in other words, the speed at which the force is moved—i.e., if my opponent carries out his retreat at the foot's point in the time of ½ sec., then I have exerted on him a power of 1,100 ft.-lbs. per second.

The horse-power is the unit, originally fixed by James Watt, in which, in this country, power is measured. Just as we speak of a length of so many yards, each yard being 36 inches, so we say a power of so many h.p., each h.p. being 550 ft.-lbs. per second. Continuing the somewhat homely example, we find that, during one crowded half-second of strenuous life, I was exerting a power of 2 h.p.

The Practical Application.

In the case of an aeroplane, the actual power used is represented by the product of the speed in feet per second, and the thrust. Now, the thrust itself is governed by the efficiency of the machine, being equal to the weight multiplied by this efficiency. So that we have two distinct figures representing power: first, the power of the engine as found on the brake; second, a value obtained by multiplying together the useful load and the speed in feet per second. This must be divided by 550 to reduce it to h.p., or, if the speed is given in m.p.h., it must be divided by 375. The ratio of these two figures gives the comparative efficiency of the machine.

So that finally, to find the "efficiency factor" of any machine, all that is necessary is to proceed as follows:—Multiply the useful load by the speed in miles per hour, divide by the engine horse-power, and again by 375; or, to put the matter in what is, after all, the most explicit form,

$$e = \frac{w\ v}{375\ P},$$

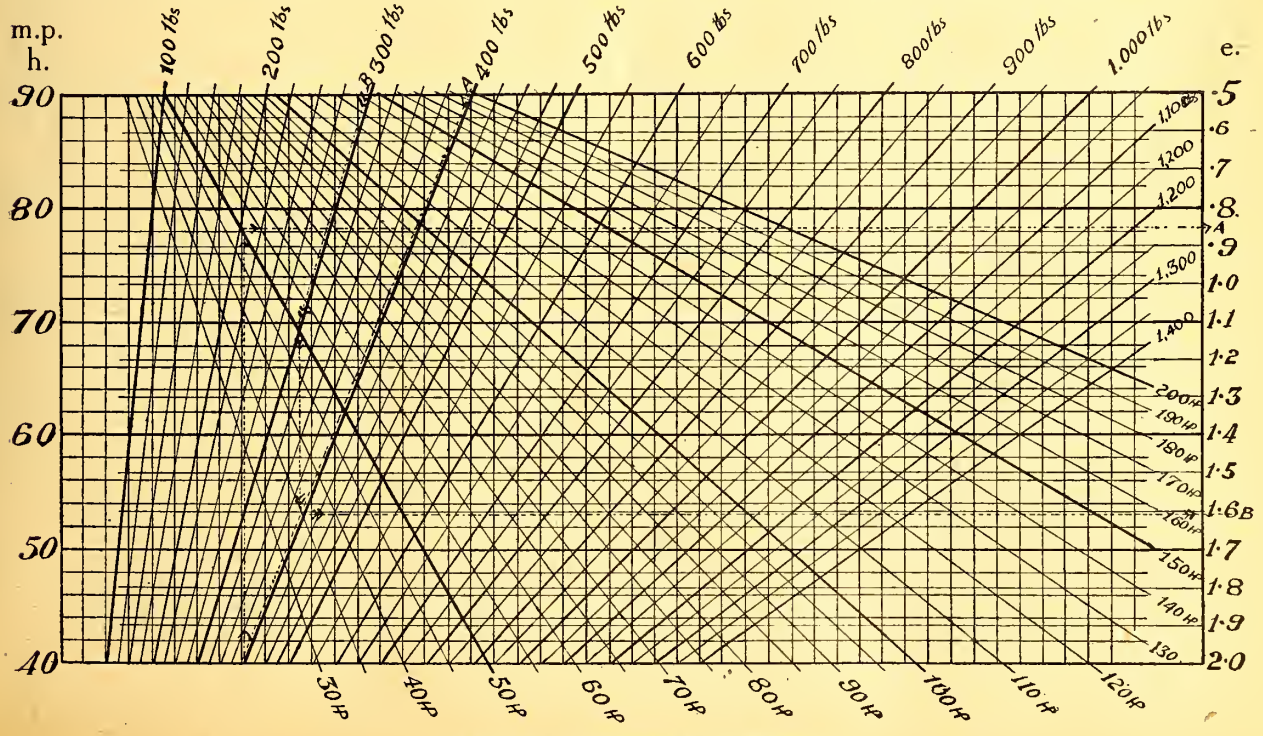
where e = efficiency factor, w = useful load, v = speed, and b = horse-power.

The curves herewith, which, to my grief, have been irreverently referred to as a parrot-cage, give the result without calculation. They are to be used as follows:—

Follow the sloping line of useful load (down from right to left) till it cuts the horizontal line of speed, follow the vertical line till it cuts the sloping line of horse-power (up from right to left). Follow the horizontal line to the right to find efficiency.

Example A: Farman type machine.—Useful load 2 persons and fuel, say, 400 lbs., speed 40 m.p.h., h.p. 50, efficiency .86.

Example B: Nieuport 1-seater.—Useful load 1 person and fuel, say, 300 lbs., speed 70 m.p.h., h.p. 35, efficiency 1.43.



The Chart of Comparative Efficiency.

An Important Development.

The Aeroplane is officially informed that the business of Mr. Howard T. Wright has been taken over by the Coventry Ordnance Works, Ltd. The construction of aeroplanes will be continued as usual at Mr. Howard Wright's works at Battersea for some time, though, in due course, building will be undertaken at Coventry, where immense facilities are available. The flying and testing of machines will be continued at Brooklands. The official title of the new business is the Aviation Department, The Coventry Ordnance Works, Limited.

This movement is actually one of the most important things which has occurred in the development of British aviation. Mr. Howard Wright is one of the pioneers of aeroplane construction in this country, and has always been noted for turning out sound, workmanlike machines, which have invariably flown exceedingly well. Like all the earlier British constructors, he has not been able to indulge in big schemes such as those tackled by the huge French firms, simply because he has had to let his business develop itself gradually. Now, however, backed by the immense resources of the Coventry Ordnance Works, which are governed by that extremely able officer, Admiral R. H. Bacon, Mr. Howard Wright should be able to show all and sundry what a really capable constructor can do.

It is eminently satisfactory to note that the whole staff of Mr. Howard Wright's business is being taken over with the business. This means that Mr. W. O. Manning, who is generally regarded by those closely in touch with aviation as a scientific designer of an ability which closely approximates to, and quite possibly reaches, real genius, will have an opportunity of giving to the world some of those ideas which some of us know to have been developing in his mind during the past year. Hitherto Mr. Manning has been obliged to design machines of the popular types demanded by customers, but the writer happens to know that Mr. Howard Wright and he have been for some months working on the designs of a new biplane which will be something quite out of the ordinary.

This machine is being slightly modified in order to comply with the conditions of the War Office Competition, but that will not interfere with its basic principles.

The Aeroplane is also able to announce that the chief pilot of this new and powerful combination is to be Mr. T. O. M. Sopwith, and certainly no finer flyer could be found to exhibit the best qualities of the machines. It will, of course, be remembered that Mr. Sopwith has already done some wonderful flights on Howard Wright machines, including the winning of the £4,000 De Forest prize, when he broke the world's record for a non-stop cross-country flight, and incidentally became the first man to fly an all-British machine across the Channel, and the first to fly from England to Belgium.

Taking it all round, the alliance of Admiral Bacon, Mr. Howard Wright, Mr. Manning, and Mr. Sopwith ought to have notable effect in the War Office Competition, and should reap handsome rewards both from the Army and the Navy when at last our aerial defences begin to be put on something like an adequate footing.

Further Movements at Hendon.

The many friends of Mr. Clement Greswell will be glad to hear that after some months of dissociation from the Grahame-White Aviation Company he has returned to Hendon to resume the instruction of pupils. In the interim Mr. Greswell has been down in Devonshire quietly assisting a well-known Devonshire landowner in studying the art of flying, and it is probable that ere long the latter gentleman will be taking a very active part in fostering British aviation.

Mr. Clement Greswell, again Chief Pilot at the Grahame-White School.

Mr. Richard Gates has certainly done well in again securing Mr. Greswell's services as instructor, for, though still young, he is a fine, steady flyer, who thoroughly understands his machines, and he has a personality which inspires confidence in his pupils, as well as putting them at once on friendly terms with him.

The renewal to the former association of Mr. Greswell and the Grahame-White Company must, therefore, be eminently satisfactory to those who wish well to the Hendon Aerodrome, where, since Mr. Grahame-White's business has kept him so much in the United States, there has not been quite the continuity of instruction by one pilot which is advisable if pupils are to be got through quickly for their certificates. And, of course, when Mr. Grahame-White returns, he and Mr. Greswell will be able to give pupils particularly good training.

Moreover, there are now plenty of machines in excellent order in the Grahame-White sheds, and the workshops are splendidly equipped to handle repairs to both machines and engines, so pupils are sure to find not only excellent instruction, but what is, if anything, more necessary, sufficient machines for school purposes, so that if a machine is temporarily laid up for repairs there need be no stopping of school work.

Among the machines available for school work at present are the "American" Farman, which Mr. Grahame-White flew in the States; a British-built biplane of Farman type, which has been thoroughly overhauled; a Sommer biplane, which has done hardly any work so far; Mr. Grahame-White's 100 h.p. Blériot, which will probably be fitted with a 50 h.p. engine for ordinary flying; and an older Blériot, which will be fitted with an Anzani engine for school work. In addition Mr. Grahame-White's 70 h.p. two-seater Nieuport will be returning from America in the near future, and should make a particularly fascinating machine for passenger flying, for those whose ambitions go beyond wallowing round an aerodrome on the edge of a box-kite, a form of amusement which may be well enough for pupils in their early stages, but is not real flying.

Altogether, with any luck, the Grahame-White Company should be able to put a number of pupils through at once for their certificates either on monoplanes or biplanes, and do it in quick time, too.

The War Office Trials.

The Aeroplane is able to state on reliable authority that the War Office Competition will commence towards the end of July. Though the authorities were anxious to meet the wishes of the British constructors, so as to give them a fair chance of good weather in which to tune their machines, it was found that September was impossible owing to army manœuvres. Consequently it was decided to start the competition in July, so as to get everything finished by the end of August, and permit those of the machines which might be purchased by the War Office to be used on manœuvres in September.

The Week's Work.

Monday, January 1st.

BROOKLANDS.—Sippe, on Avro-Viale, went for first part of brevêt. Did turns in good style, and finished with glide from 290 or 300 feet, with engine cut off. Made straight for observers, who fled, consequently landed too far from original spot chosen. Tried landing test again, and succeeded admirably. Second test postponed owing to weather. Setti also out on Avro-Viale, doing straights.

At Deperdussin School, Lieut. Porte, R.N., out testing rebuilt brevêt machine, now repaired after Baldwin's smash. Lieut. Gill, R.A., and Signor Sabelli out afterwards.

Bloudeau up with Lieut. Ash, R.N., a new pupil; and Lieut. Hewlett, R.N., also out on Blondeau-Hewlett biplane.

Herbert Spencer up alone, doing test flights.

At Bristol school, Fleming up at 3,000 feet testing, and later up with Lieut. Smith over Weybridge, when Gnôme struck work, but managed to glide back into the aerodrome. Bad day for Gnômes, as both of the Bristols and the Blondeau engines giving trouble.

HENDON.—New Year opened with return of Mr. Clement Greswell, who soon had school Farman No. 2 out, and made couple of circuits, prior to taking up lady passenger; and, in spite of inclement weather, school has been busy.

During week Mr. Henry C. Biard, a new pupil, has been out whenever possible, and is making rapid progress, taking full charge of machine with 50 h.p. Gnôme, and is seemingly thoroughly conversant with the controls already. Gates has been making good straights, with fine, steady landings; and Raphaite continues to improve in rolling practice and in knowledge of the controls. Many of machines have been tested after thorough overhauling, and spell of anything like decent weather should see some good work put in.

At Blériot school Allen doing circuits, Desoutter doing figures of eight. Morris and Welburn making excellent straight flights.

FILEY.—The New Year begun by Mr. Blackburn and Brereton, new pilot, late of the Bristol school, when manœuvres were executed in grand style. The rest of week spent in overhauling machines in hangars, as pupils have not yet returned from holidays.

Tuesday, January 2nd.

BROOKLANDS.—Sippe out training on Avro-Viale, flying twice for half an hour non-stop. Setti out on Avro-Green.

At Deperdussin school, Lieut. Gill and Sabelli both flying brevêt machine, former beginning to do curves.

Herbert Spencer still tuning up his biplane.

At Bristol school, Lieut. Smith starting to do straight flights and shaping uncommonly well. Warren also entered solo flying stage. At first attempt at landing, switched off rather too soon, machine began to pancake, so, with great presence of mind, switched on again, and made excellent landing. Very good for a beginner. Fleming also out with various pupils.

Blondeau out with Lieut. Ash, R.N., and Lieut. Hewlett flying well alone.

HENDON.—Allen, Desoutter, Morris, and Welburn all flying on Blériots. Pothet and Gordon Jones making steady progress.

THE PLAIN.—Jullerot out in morning, giving lesson to Lieut. Brodigan on Bristol school machine. Later in week, H. R. Fleming arrived from Brooklands to learn to fly monoplane, C. P. Pizey having returned to take up instruction there.

THE PLAIN (Air Battalion).—Captain Fulton and Lieut. Conner out doing flights of half-hour or so, at good height.

BRIGHTON-SHOREHAM.—Mr. M. Chanter had new monoplane out again and obtained further successful flight.

Wednesday, January 3rd.

BROOKLANDS.—Kemp out on Vickers, tuning up after alterations in engine. Sippe flying capitally as usual on Avro-Viale.

At Deperdussin school, Lieut. Gill, R.A., made first complete circuit on brevêt machine, Sabelli afterwards making three circuits on same, both pupils showing excellent progress and ability.

At Bristol school, Pizey, back from the Plain, up with Lieut. Smith. Naval Cadet Wheeler, the youngest British pilot, down for practice flying while on leave, flying magnificently, and took machine up to 2,500 feet with perfect skill and confidence.

Herbert Spencer again out alone, tuning up engine trouble.

BRIGHTON-SHOREHAM.—Mr. M. Chanter flying one of Blériots and Chanter monoplane.

Thursday, January 4th.

BROOKLANDS.—Wind and rain. Nothing doing.

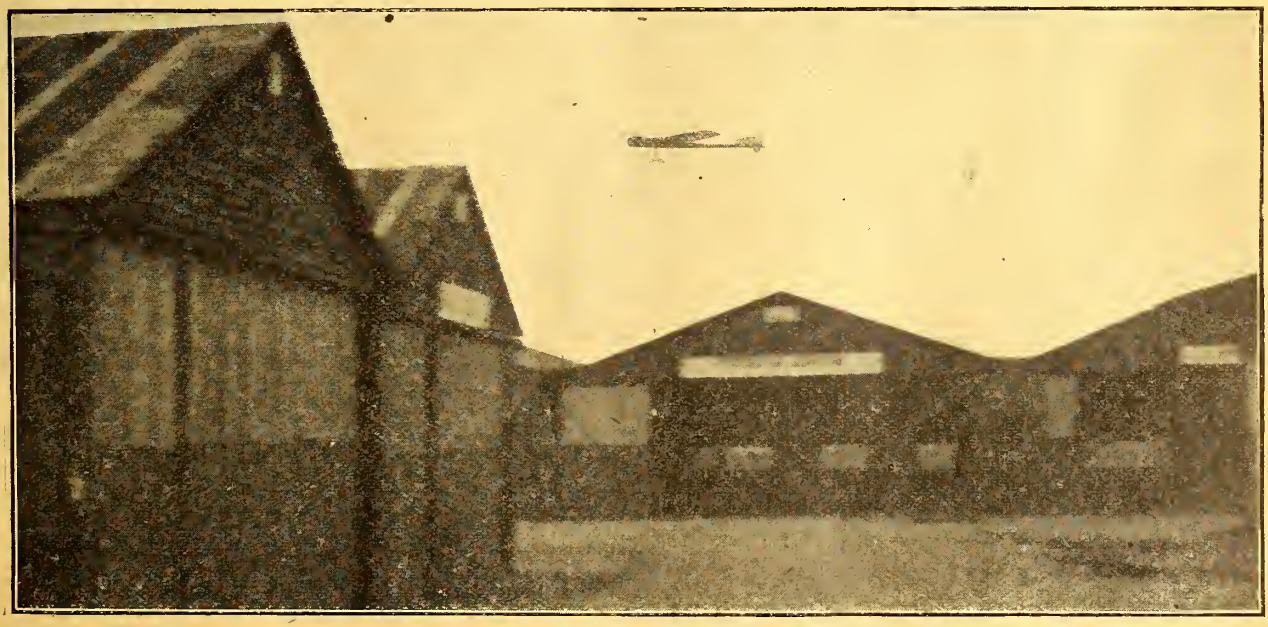
BRIGHTON-SHOREHAM.—Gassler doing straight flights on Chanter school Blériot in early morning.

Friday, January 5th.

BROOKLANDS.—More wind and more rain.

Saturday, January 6th.

BROOKLANDS.—Still more rain and wind. Work generally progressing well, and prospects of flying as soon as fine weather arrives are excellent. Flanders monoplane nearly ready to appear again. New planes, built on novel principle, evidently immensely strong and possessing huge factor of safety. Streamline of fuselage improved, and radiators better placed.



Mr. T. O. M. Sopwith and a passenger on the Martin-Handasyde monoplane, over the sheds at Brooklands.

Pashleys have repairs of old Humber completed, and have been trying to get engine up to concert pitch.

Raynham has left Avro school. Here is a first class pilot open for an engagement. Will be well worth having for Army Competition.

Lieut. Porte's racing Deperdussin, rebuilt after smash at start of "Circuit," now back at Brooklands, and fitted with latest type Y Anzani, giving fine results on test, and running very sweetly.

Percival biplane, after satisfactory trials before Christmas, now having fuselage cased in, and other details finished.

Blackburn, of Colossoplane, unfortunately laid up with pneumonia, following on influenza—best wishes for early recovery. Ducrocq, back from Paris, also down with influenza.

Sunday, January 7th.

Brooklands.—Less rain, but very bad wind, so no flying. Quite a good number of visitors down, including General Henderson, Mr. Mervyn O'Gorman, and Lieut. Longmore, R.N., who showed much interest in construction of Flanders machine. Vickers machine out testing engine, as also *Parseval I.*

Martin and Handasyde very well pleased with Sopwith's flight to St. Alban's, unfortunately finished by taxi-ing into a hidden ditch and smashing propeller and skid. Both regretting no more Antoinette engines to be had. One now in machine turning big Chauvière propeller at 1,400 revs. per minute on ground, running up to 1,600 in air. M. Chauvière insists that at that speed and with that propeller, engine must be giving between 90 and 100 h.p. Antoinette only supposed to run at about 1,200, but under Handasyde's skilful tuning seems well able to stand up to overload. Plans now in hand for new Martin-Handasyde built entirely of steel, for Army Competition. Let us hope it will be as successful as latest wooden machine.

Sopwith's Howard Wright "family tank," also the Blériot, and Burgess-Wright, expected at Brooklands during week, so plenty of variety in prospect.

Weymouth.—In a gusty wind, Lieut. Spencer Grey, piloting his Blackburn monoplane, flew over the Home Fleet off Portland. Starting from Lodmoor at noon, he flew out to sea and circled several times over battleships, being loudly cheered by crews. Afterwards he flew over Weymouth, and landed well near his shed.

The Plain (Air Battalion).—Lieut. B. Kennett made splendid flight in very gusty wind for three-quarters of an hour on Nieuport, flying at what seemed terrific speed. He is delighted with speed and behaviour of machine.

Mr. Chattaway, the first British pilot to take his certificate on a Deperdussin, with which he is here shown.

Mr. Cody Out Again.

Having had his prize-winning biplane smashed a few weeks ago, Mr. S. F. Cody has rebuilt the old "Flying Cathedral" of 1910, and installed his 100 h.p. Austro-Daimler. The engine is pulling well, and in a trial at Farnborough on the 8th, although half throttled, it got up a much better pace than any of the Army machines. Mr. Cody calculates that the extra power will enable him to carry five passengers and enough petrol for a four-hours' flight. He has already fitted the necessary seating accommodation. Another idea which he thinks of developing is the construction of a platform under the lower plane where a man may lie and work a machine gun that will command everything in front of and below the biplane. The idea has possibilities.

Captain Burke Takes a Toss.

Army machines at Farnborough, piloted by Capt. Massy, Capt. Burke, and Mr. De Haviland, were flying at the same time that Mr. Cody was experimenting on the 8th. The weather turned gusty, and all descended safely except Capt. Burke, of the Royal Irish Regiment. His machine was caught by a squall while turning, and thrown on to the left wing. The French biplane he was flying was wrecked, but Capt. Burke escaped with very slight injury. It will be remembered that the same machine let him down almost in the same place early last year. Capt. Burke is far too valuable a man to be allowed to risk his life on unstable box-kites. If he is to return to regular flying he should be provided with a modern machine.

An Aqueous Experience.

Mr. F. B. Fowler had an exciting experience on the 8th. On that day he attempted his first long cross-country flight, his proposed journey being from Beaulieu, about six miles from Southampton, to Eastbourne. He intended to alight at the Shoreham Aerodrome. The weather was unfavourable, and as hours passed without news of him there was considerable anxiety. It was not until the afternoon that information came that he had been picked up in the sea off the Isle of Wight. Although Mr. Fowler had not taken his certificate, he had created a very favourable impression by his capable handling of his 50 h.p. at Eastbourne, as already mentioned in The Aeroplane.

Mr. Fowler got into difficulties through his Gnôme motor going wrong. To avoid a worse calamity he came down in the sea near Hurst Castle. Fortunately the Government steamer *Hawk* was near, and promptly rescued the aviator, who was little the worse for his dip. He was put ashore at Hurst Castle, and attended to by coastguards. The damaged machine was towed ashore.

Finishing the Old Year.

On Sunday, December 31st, 1911, the Blackburn pupils being away for Christmas holidays, the opportunity was taken by Mr. Blackburn to enjoy a few flights himself, so he was out from 3 o'clock till dark, putting in good short flights, handling the "Isaacson" Blackburn monoplane excellently. What with Lieut. Spencer Grey, R.N., Mr. B. C. Hucks, Mr. Blackburn himself, and Mr. Brereton as pilots, the Blackburn machine has new opportunities of distinction.

Another Proposed Marine Aeroplane.

Mr. Eardley Billing, who is at present looking after the Deperdussin School at Brooklands, is engaged in designing and making floats, which are to be put on to one of the 35 h.p. machines. It has not yet been decided where the machine is to be tried, but it is expected to have her ready for trials in about a month's time.

An Inter-University Race.

Will such aviators as are graduates, or past or present undergraduates, of the Universities of Oxford and Cambridge, and are willing to take part in a prospective aeroplane race between teams representing these Universities, kindly communicate with the Editor of The Aeroplane, 166, Piccadilly.

The Aircraft Factory's Aeroplane.

A correspondent writes that New Year's Day was aptly chosen by the officials of the Army Aircraft Factory at Farnborough for the first trials of the new aeroplane.

The great advantage that this machine has is that it is practically silent in flight, the only sound heard being a low hum from the propellers when near the ground, and a whistling noise arising from the passage of the wind through the radiators. It is expected that the latter will disappear entirely under the improvements which are being considered.

The silencing of the engine has been effected by the attachment of a simple apparatus to the exhaust and the provision of four blades to the propeller, which, with the engine, is placed in front. [This needs investigation.—ED.]

The machine is of the biplane type, resembling the Bréguet in most respects, but has improved stability, attained by the automatic warping of the planes. There are no ailerons, and the rudder is placed at the end of a "tail," which also carries elevator planes. The Wolseley engine is the one which was fitted to the old Voisin.

Another great improvement has been effected by the new starting appliance, by which the pilot can, unaided, set the propeller going before climbing into his seat, and get away without assistance.

There is accommodation for a passenger behind the pilot's seat, and at the trial flights, carried out by Mr. G. de Haviland, several members of the Air Battalion, R.E., were carried in succession. The flights have been attended with every success, and an extraordinary speed has been attained. The automatic warping ensured absolute steadiness, even with a fairly stiff and varying wind prevailing.

Another novel feature of the machine is the skid which projects beneath the rear of the body. It is movable, like a rudder, and with its help sharp curves can be made when running on the ground. A complete circle, little more in diameter than the length of the machine, which is 27 feet from the front to the back, can be made, thus enabling the pilot on descending to avoid obstacles which might be lying about.

Mr. Valentine's Flights in France.

It was remarked in one of the French journals that France had not, with the end of the Aero Exhibition, heard the last of the Bristol monoplane, the only exhibit there from this country, and evidence of the correctness of their expectations has already been given by the fine flight made by Mr. James Valentine on January 2nd. It was a matter of very particular importance that the Bristol monoplane should be at St. Cyr on Tuesday to fulfil an engagement on the following day, and Mr. Valentine, being on Monday night informed of this, undertook to take it there by air next day.

Tuesday morning broke and appeared by no means a promising day for the flight, but Valentine, nevertheless, went to Issy-les-Moulineux to start early, intending to take the journey before the weather got worse. He must, therefore, have been considerably disappointed on arriving to find the monoplane at the very back of the long Clement Bayard dirigible balloon shed, with many machines in various stages of repair between it and the exit. The difficulties of getting the machine out were added to by the fact that the caretaker could not be found, and it was not till 11.30 that Valentine and his assistants succeeded in getting the machine out on to the flying ground, after having had to carry it bodily over various obstacles. In consequence of the delays the motor could not be got going properly before mid-day, and the machine had to be returned to its shed—no flying being permitted on the ground between the hours of 12 and 3.

The lateness of the hour and the state of the weather were now getting serious, but Valentine, having promised to get the machine to St. Cyr, still meant to go, and at three o'clock he had the machine out again, but the Gnôme refused to run without mis-firing, and it was approaching four o'clock before the motor was turning at anything like its proper speed.

Even then it was running in a manner that was far from satisfactory, but the start was made, Mr. Valentine taking as passenger Mr. Ronald Charteris, to whom THE AEROPLANE is indebted for the account of the proceedings.

The wind and rain had now increased, and, owing to the thick clouds overhead, it was soon found impossible to climb to the height which is desirable when flying over the country which had to be crossed, where the only possible landing-place, had the motor stopped, would have been the River Seine. That this motor trouble had to be feared was soon evident, for the revolutions of the propeller began steadily to drop. However, thanks to the efficiency of the machine, Valentine was able to keep her up, in spite of the wind and loss of power.

With Gnôme and light rapidly failing them, the voyagers now began to fear they had lost their way, the country being quite unknown to them, and no possible landing-place appearing in sight.

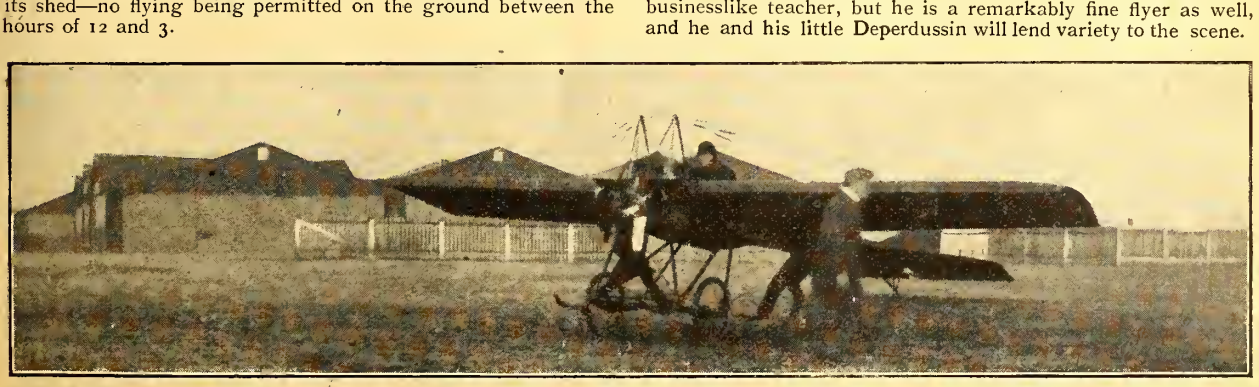
At last, however, Valentine perceived the military dirigible sheds at St. Cyr, and was circling the ground in search of an alighting-place when the Gnôme completely gave out. This could not have happened at a more inopportune moment, as the hangars were between the aeroplane and the proper landing-ground, and Valentine was already banking the machine to its limit, making a sharp turn towards the dirigible shed.

For several moments it appeared that an *atterissage trés mauvais* on to the hangars was inevitable, but the gliding angle of the monoplane proved sufficient to carry it over them, and a safe landing was made.

Another of Mr. Valentine's feats while in France is also worthy of note. He had taken Captain Agostini, of the Italian Staff, up as passenger at Issy, and in descending they found their landing baulked by troops, as did Train in the fatal accident to the French War Minister at the start of the Paris-Madrid race. Valentine managed to clear them, but could only make a landing by flying practically through a tree. This he did, carrying away a branch with one wing, though he fortunately missed hitting anything with the propeller. In spite of this he made a safe landing, and Captain Agostini was so impressed by the strength of the Bristol that orders for a couple of machines for the Italian War Office arrived before the week was out.

The Latest Arrival at Hendon.

Mr. W. H. Ewen, now properly settled down at Hendon, is quite cheerful about his prospects there. Already he has got four new pupils since he arrived, and he is in negotiation with several others. All he is waiting for is some reasonably fine weather to get his pupils out on the taxi-Blériot, the 35 h.p. Deperdussin being, of course, kept for the finishing touches when the pupils are ready for their brevêt tests. Mr. Ewen expresses himself as delighted with the Hendon ground, and says he has received every consideration and much material assistance from Mr. Richard Gates, and the rest of the management staff of the aerodrome. Until his engine incontinently exploded the other day Mr. Ewen himself had been flying very well on the Deperdussin, and the machine is meeting with commendation from the members of the other schools at Hendon. Undoubtedly, when the weather settles Mr. Ewen will be one of the greatest attractions at Hendon, for not only is he a sound businesslike teacher, but he is a remarkably fine flyer as well, and he and his little Deperdussin will lend variety to the scene.



Mr. Chattaway starting out on the Deperdussin brevêt machine.

The Resistance of Aeroplane Bodies.

" That she might be docile to the helm,
And that the currents of parted seas
Closing behind with mighty force
Might aid, and not impede, her course."
—Longfellow.

It has been fully recognised that one of the chief things to be desired in an aeroplane is speed. To a great extent, speed means stability, and it increases the capabilities of an aeroplane as an all-weather machine.

The ways of obtaining speed may be divided into two great classes. First, it is possible to attain a high speed by using a disproportionately powerful engine, and cutting the supporting surface down to an unsafe minimum. Secondly, the same end can be achieved with much less power by designing the machine in such a way that there is the absolute minimum of head resistance offered, and that the least possible number of eddies are formed.

Designers in general have now accepted the latter way as being the better of the two, and in consequence their machines are designed so that their resistance is reduced. Unfortunately, these laudable efforts nearly always stop half-way.

I have one particular machine in mind where the tail portion is of very good streamline form, but in the front part comes up, rectangular in section (which section may in itself occasion undesirable eddies), to what is, for all practical purposes, a flat front, about three feet or so across.

Now that flat front takes some shoving through the air, that is, considering its head resistance and nothing else. In addition to the head resistance, however, there is about three feet taken off the effective diameter of the propeller, there is a Gnôme engine churning up the air and finally flinging it out tangentially to the detriment of the efficiency of the next six inches or so of each propeller blade, and then there is the not remote possibility of the formation of unwished-for surfaces of discontinuity at the front edges of the body.

So, taking all things together, it appears that that flat front, plus the Gnôme engine, is going to create a lot of resistance and inefficiency, more than its size would suggest.

With the object of testing this theory, I constructed three monoplane gliders (Hanriot type) of about 10½ inches span. They were absolutely identical in every respect, with the exception that one was fitted with a 2.75 inch propeller and a small weight, the next was fitted with a dummy seven-cylinder rotary engine, one inch in diameter, and a similar propeller, and the third with a 1 inch disc and a similar propeller.

As the surface weight and balance of each model were the same, differences in gliding would be due to the " motors."

As I thought that the results might be useful, I tabulated them, and they are as follows.

The propellers and "motors" were free to rotate in each case.

Angle of descent.—No. 1, 1 in 7; No. 2, 1 in 4; No. 3, 1 in 3.

Speed.—No. 1, fast; No. 2, slow; No. 3, very slow.

Stability.—No. 1, good; No. 2, indifferent; No. 3, poor.

No. 1, propeller and small weight (to compensate for absence of motor; No. 2, propeller and seven-cylinder "motor"; No. 3, propeller and 1 inch disc.

These results show that the rotary motor is nearly as bad as a disc of the same diameter, but not quite.

Some designers, having appreciated the advisability of a good entry, provide one of very good streamline form, and a properly shaped body to a point just aft of the passenger's seat and tanks. The body then ends in what is practically a flat face, or sometimes a Gnôme engine, which, as I have shown, is nearly as bad.

The result of this is that surfaces of discontinuity are formed in the rear of the body, and a considerable amount of air is dragged along as a wake. This dragging of so much air uses up some power that ought to be spent in driving the machine faster, or economising in fuel.

Usually, as the machines that sin in this respect belong chiefly to the 1—2—P—2, 1—2—P—1, 0—2—P—1, and 1—2—P—0 types, the propeller works in this wake, and so some of the lost power is recovered, but I very much doubt whether the gain counterbalances the losses.

Again, in some machines, the propeller works quite close up to the flat end of the fuselage, and thus a good part of the propeller is effectively prevented from getting its proper supply of air, and is what one might call " starved."

Some designers provide a body of excellent streamline form both fore and aft, and then they place a radial or semi-radial engine immediately in front of it, and just behind the propeller. Now this engine is most decidedly *not* of streamline form, and so the flow of air from the propeller is broken up pretty considerably. Once more there are the two evils of head resistance and interrupted flow of air.

A few designers cover up their engines (usually of the V or vertical type) altogether in a bonnet of more or less streamline form, and continue it back as a scuttle dash as far as the pilot's seat. The propeller gets a fair chance to do its work properly, and the head resistance is reduced, with the result that the speed goes up.

The chief fault here is that the scuttle dash stops short at the pilot's seat, and in consequence there are some more surfaces of discontinuity, and their attendant eddies, formed.

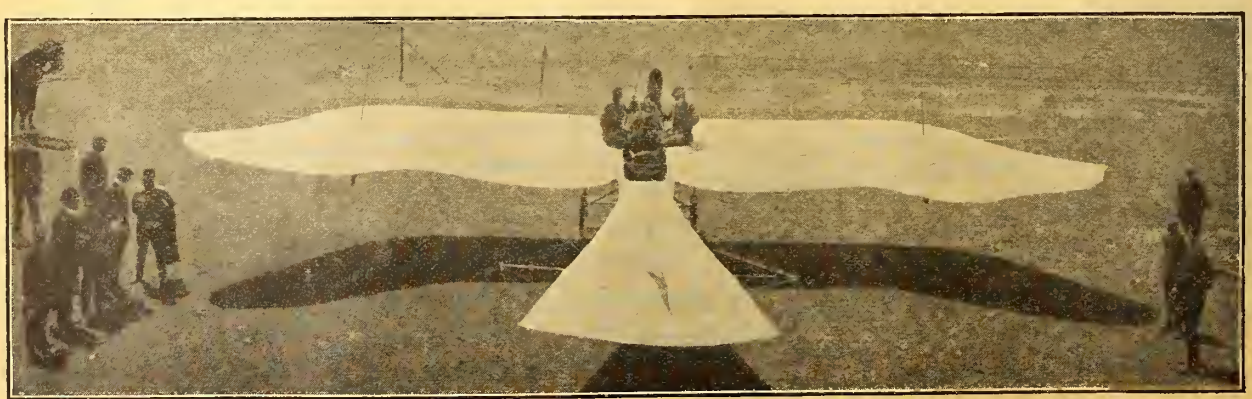
One or two machines are designed so that the greater part, if not all, of the engine goes inside a proper streamline body, as witness the Paulhan-Tatin monoplane. The propeller, whether in front or behind, then gets its chance to work right from boss to tip, with an uninterrupted supply of air and an uninterrupted flow from the propeller. This system seems particularly adaptable for motors cooled on the Renault or Pipe systems, i.e., with air through a "water-jacket."

The body of an aeroplane, especially of the monoplane type, is an unfortunate necessity, and it often makes its undesirability felt when doing a sharp turn. The side resistance of a Nieuport or Bristol body, with its slab sides and great depth must be a good deal.

Some constructors, recognising this, leave the latter part of the body uncovered, in order to reduce the turning circle. This, however, immediately exposes several struts and much wiring, creating more head resistance and slowing the machine.

The new Blériot body, with the tail sprouting from the fuselage, seems to be one of the best ways of reducing both head and side resistance that have been evolved, and I should not be surprised to hear that it offers much less head resistance than a good many fuselages of the box type.

The next best way seems to be to adopt a body with an oval section forward, the longer axis being vertical, tapering to a "triangular circle" section aft, the sides of the triangle being really arcs of circles, the corners smaller arcs, and the apex of the triangle being downward. The section of the tail part, when the machine is banked over and doing a turn, will be in some sort a streamline one, as it will be moving with one side of the triangle facing the wind.—S. W.



Back view of the Etrich monoplane (with Austro-Daimler engine), one of the most cleverly designed of aeroplanes.

How I Made a 35 h.p. Engine Go.

By H. G. FERGUSON.

There must be a great number of 35 h.p. J.A.P. air-cooled engines lying unused in aeroplane sheds all over the country. I believe this to be one of the most substantially-built engines on the market, and I am confident, if their owners took pains to get over the several minor troubles which these motors are subject to, they would find that they really had an excellent engine to work with. I cannot think of any engine which would be more economical to run or more reliable for school work, and I have no hesitation in saying that if these engines were fished out of their sheds, and the alteration made to them which I have made to mine, that we should hear a lot more about them and see them in use daily.

The things which, in my opinion, completely spoil this otherwise excellent engine are :—

Firstly, overheating after about seven minutes' running.

Secondly, the flow of oil into the pilot's face, making flight almost impossible.

Thirdly, the low horse-power developed by the engine after it has been running a few minutes, consequent on overheating.

Fourthly, the danger of fire; and

Fifthly, the fact that the engine will not turn slowly.

When flying with my machine at Magilligan last year I always found that after five to seven minutes' flight the pistons would run perfectly dry, and this would be the case no matter how much oil I started off with in my crank case or how much I let run into the cylinders by the usual "J.A.P." methods.

Of course, with dry pistons no engine will keep cool, and I quickly came to the conclusion that the overheating was due entirely to bad lubrication, and that the bad lubrication was due to the open ports in the cylinders letting the oil escape. There are lots of ways of closing up auxiliary ports, but the best way I found, after experimenting, was to tap the holes in the cylinders with a very fine thread tap and then screw slightly tapered plugs into the holes, taking full advantage of the depth of the thread by letting the plug go in as far as it could without touching the piston.

When I had all these plugs screwed in I ran a saw-mark round them, and then put a piece of wire round the groove thus made to keep them from screwing out. This, however, was hardly necessary, owing to the fact that when the engine gets hot the plugs get tighter.

I then fitted a set of exhaust pipes, which carried the exhaust gas, and any oil that might be going, clear of the machine.

I was well aware that these alterations would necessitate my making many more important alterations to the engine, because these open ports play a very important part in the filling up of the cylinder on the induction stroke and in letting the gas away on the exhaust stroke.

To make certain that there would be no possibility of the gas being choked going into the engine I went over all the inlet passages from the valves right out to the crown piece in the centre of the inlet pipes; I made more room past the inlet valve guides, and rounded off the corners of the valves; made all the joints in the pipes dead opposite to each other by filing and fitting them until they were right. I had a lot of work in doing this, because the design of these engines being for open ports there is not much clearance about the passages.

The next thing I looked to was the lift of the inlet valves; I found that, with Messrs. Prestwich's setting, they only opened 11-64 in. This was quite sufficient when the auxiliary ports were open, but not enough with them closed. By adjusting the tappets I managed to get all my inlets a full 3-16 in. lift, but to do this I had to leave a clearance of only 6-1,000 in. between the tappet and the valve stem at the highest point on the back of the cam.

Exhaust valves and exhaust valve guides I treated in the same way, and left exactly the same clearance between the tappet and the valve stem.

I do not think this engine ought to be run at a lower speed than 1,600 revolutions per minute if best results are desired. A valve lift of 3-16 in. is, in my opinion, not quite sufficient for this speed, and I decided on having the cam shaft taken out and enough ground off the back of the cams to allow the valves to lift about $\frac{1}{4}$ in. This can easily be done, but I had not time.

The setting of the valves on my engine when it came from Messrs. Prestwich's was as follows :—

Inlet valves lifting approximately $\frac{1}{8}$ in. down induction stroke and closing about $\frac{3}{8}$ in. up the compression stroke.

Exhaust valves lifting approximately 3-16 in. after the auxiliary ports had been uncovered, and closing over dead centre at end of exhaust stroke.

I advanced the timing one tooth, which, in conjunction with the adjustments I had made to the tappets, made the timing just right. The inlet valves then opened on dead centre and closed about $\frac{1}{4}$ in. up compression stroke. The exhaust valves opened when the pistons were a full $\frac{1}{2}$ in. from the end of firing stroke, and closed on dead centre at the end of exhaust stroke.

A tooth either way in the timing makes practically no difference when the auxiliary ports are open, but it makes a great difference to the cool running and efficiency when the ports are closed.

From the first I never liked the carburettor as fitted to the engine, and in its place I fitted a No. 40 White and Poppe. I fitted this below the crank-case, so that I would have no trouble with pressure feed, and would, at the same time, reduce the danger of fire to a minimum. I connected a good large-sized inlet pipe with very easy bends from the carburettor to the existing crown piece above, and have not the slightest hesitation in saying that the fitting of this carburettor played a very important part in the great improvement made to the engine. I consider the White and Poppe, if properly set, to be the best carburettor in the world for aeroplane work.

I know many have had these carburettors fitted to their engines and that they did not get wonderful results from them, but I feel quite certain that the carburettors were not rightly adjusted to the engine, or perfect results would have been obtained. I may say in connection with this that I experimented to find if I could do without a hot-air pipe, and I found that it was essential to fit one. I fitted a pipe 8 ins. long over one of my exhaust pipes and adjusted the carburettor to give best results when the engine had warmed up. Since then I have not had the slightest trouble with the engine, nor have I had to clean a sparking plug all the season, owing to the fact that I have got my mixture right at all positions of the throttle.

After making the above alterations I tested the engine for pull, and found that with one of T. W. Clarke's propellers, which only gave 260 lbs. pull before, it now gives a little over 320 lbs. pull. There could have been no mistake about this increase in power, as I made the tests under exactly similar conditions, and, besides, the fact that the machine will now fly with a big passenger, while it would hardly fly before with the pilot alone, shows the wonderful improvement that has been made so far as power is concerned.

After the power test I tested for over-heating. Formerly, after running for five minutes the pull fell off very considerably. After the alterations I ran the engine all out for twelve minutes without running any oil into it, and just allowing it to lubricate by splash from the crank-case. There were no signs of heating up whatsoever nor fall off in pull, and when I removed some of the auxiliary exhaust port plugs to see how the pistons were oiled I found they were all perfectly lubricated, whereas formerly they would have been quite dry.

Summed up, then, I got over my first trouble of over-heating by making the lubrication right. I got over the second trouble of oil flowing into the pilot's face by closing up the auxiliary ports and fitting exhaust pipes. I got over my third trouble of low horse-power by making the lubrication right, and getting a more uniform mixture by closing the auxiliary exhaust ports and fitting a new carburettor. I got over my fourth trouble of the danger of fire by closing the ports and fitting the carburettor below the engine; and, fifthly, as there are no auxiliary ports, the engine will turn round at something below 200 r.p.m.

Taking things all round, I am now very proud of my J.A.P. engine, and, so far as reliability is concerned, I could wish for nothing better. I have not cleaned a cylinder, ground a valve, nor made any adjustments whatsoever since last July, and the engine is pulling as well at the present moment as it was then.

More Flying in Australia.

At the opening of the aviation school at Penrith, New South Wales, last week, Mr. Hart, the first Australian to secure a pilot's certificate, carried the Postmaster-General and Mrs. Frazer in several short flights on his Bristol biplane. He is a pupil of Mr. J. MacDonald's, and is the first Australian to take his brevêt in Australia.

Local Patriotism.

Last week The Aeroplane suggested that, in view of the slowness of the Government to take proper steps towards placing our aerial defences in a safe position, it would be well if some of our big provincial cities and all our counties were to organise a subscription scheme by which each city or county would present a properly equipped aeroplane to the Army.

It is, therefore, satisfactory to learn that one of the greatest and most powerful of the Conservative papers has exactly such a scheme under consideration. Before any definite steps can be taken it is necessary to obtain an assurance from the War Office that the machines will be accepted and used when presented, and will not be relegated to idleness as were the Valkyries presented by Mr. Barber to the Navy and Army

Subject to this assurance, the paper in question may make its announcement at any moment, and it has sufficient influence among the better class people in this country to ensure its efforts being crowned with the success they deserve.

Lubrication Troubles.

One of the chief causes of engine failure is bad lubrication, and one of the chief causes of bad lubrication is bad oil. It was bad lubrication which caused most of the British competitors in the "Circuit of Britain" to come down, and at least three of them, to the writer's knowledge, who would certainly have completed the course close up to the leaders, owed their troubles simply to bad oil.

Some things are dear at any price, and although it may be a good advertisement for a firm to present oil free of charge to well-known aviators, it is poor consolation to the aviator who has been forced to land in bad ground owing to sooted valves, or seized pistons, to think, as he reckons up the damage done to his machine, that, at any rate, he had saved a few shillings, or a few pounds, on his oil bill, when, by paying a respectable price for a really good article, he might have been spared all the expenses of the smash, as well as the personal risks.

It is even said, among aviators, that a certain well-known flyer draws quite a handsome fee per annum for using a certain oil, supplied gratis; which he does—on school machines, though the legend has it that when he goes out for a big flight he uses another kind of oil, and pays for it.

When The Aeroplane comes across a really good thing it says so, and a friend of the writer's, who has had a deal of trouble with the lubrication of certain high-speed engines, which run up to 3,000 revs. per minute for long stretches at a time, assures him that after years of experiment with various oils he at last found in the lubricants turned out by J. Strang and Co., of Glasgow, an oil which is thoroughly satisfactory for the work. Messrs. Strang and Co. are an old-established firm, who have always conducted their business on the principle that satisfied customers are the best recommendation. Their oils are sold at a fair price, and are full value for the money. If they cost more per gallon than some others, they give more than the difference in price in the amount of lubrication to be obtained from a given quantity. The Aeroplane, therefore, strongly recommends those aviators who think more of the running of their engines than they do of getting their lubricants "on the cheap" to give Messrs. Strang's oils a fair trial.

Another Ninety-Miler.

Apparently the Paulhan "torpedo" is not to be left in undisputed possession of the claim to be the fastest thing in the air. The latest speed instrument is the new Deperdussin, with 100 h.p. engine. On a carefully timed test, Védrines, who is now definitely engaged as chief pilot of the Deperdussin firm, has flown the new racer round a circuit course at a speed of 150 kms. per hour, or 90 miles per hour. The speed in the straight is calculated to be 160 kms. per hour, or 96 miles per hour. Lieut. Porte, of the British Deperdussin Company, says that the wings are of an entirely novel design, and at first sight appear to upset all the theories of aerodynamics. It is to be hoped that one of these machines may be seen in this country, if only as an object-lesson to the Army.

Anzani Cylinder Troubles

It appears that some trouble has re-appeared with the cylinders of the new air-cooled Anzani engines. The Anzani, in one of the Bristol monoplanes on Salisbury Plain, is said to have blown several cylinders off, and on December 30th Mr. W. H. Ewen, when flying his Anzani-Deperdussin at Hendon, had a lump blown out of the centre cylinder when at a height of 250 or 300 feet over Mill Hill. Fortunately, he was not hurt by the pieces which burst out, and was able to glide safely back to the aerodrome, but it was a narrow escape. M. Anzani's excuse for the trouble is that he got in a batch of about fifty cylinders which were all machined up before it was found that the material of which they were cast was wrong. By that time they were all mixed up with other cylinders, and some had gone out on engines. Consequently it was impossible to sort them out from the others, and they can only be eliminated by waiting till they burst, and then replacing them. The reason seems a perfectly valid and genuine one, but it is a pity this should happen just when the engine was living down its previous unenviable reputation in this very same respect, for apart from this defect the Anzani is a very fine engine indeed.

Turkey, Tyck, and Van den Born.

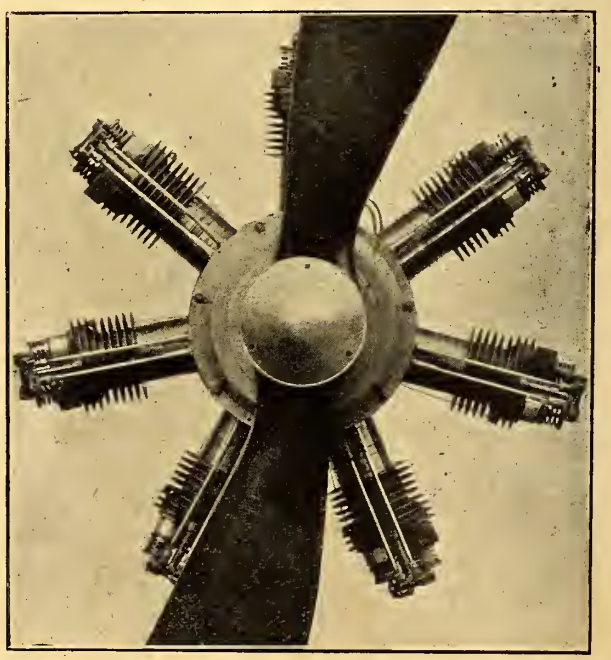
Van den Born and Tyck, who were reported to have joined the Turkish forces as aeroplane scouts, are at some pains to deny the rumour, which they characterise as absolutely without foundation. However, there are several pilots, including one or two Englishmen, who are negotiating for service with Turkey, either as actual air-scouts or as instructors.

A Help to the Cause.

The Aeroplane desires to bear witness to the good work done for aviation by *Brighton and Hove Society*, a weekly journal which carries much weight in those popular resorts. This journal has for some time been among the very few who are devoting space regularly to aviation. Its notes on the subject, which are very well done by Mr. Clarence A. C. Winchester, are always clear and concise, and, though quite acceptable to the general public, are free from the technical inaccuracies which mar the work of so many otherwise good men. This, of course, is largely accounted for by the fact that Mr. Winchester devotes as much time as possible to studying the machines at the Brighton-Shoreham Aerodrome, and so is *au fait* with the latest happenings. It is to be hoped that *B. and H. S.* will continue its good work, and, if anything, increase the amount of attention it gives to aviation.

For School Machines.

Proprietors of schools, or experimenters, who are on the look-out for cheap, lower-powered engines for school machines are recommended to communicate with Madison Motors, who advertise that they have several genuine Anzani engines of 25 h.p. for sale cheap.



The Isaacson Radial Engine, built by Manning, Wardle and Co., of Leeds.—This is one of the finest examples of its type, and has given excellent results on Blackburn and Bristol monoplanes. A new 35-h.p. of the same type is now being produced without internal gearing.

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Used in the "CIRCUIT OF BRITAIN" and all Cross-country flights. **Clift Maps** were used by Vidart, Kimmerling, Valentine and others in the European Circuit, and by the majority of flyers in the British Circuit.

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is now being produced under our personal supervision at our own works in Surbiton, and each machine is built, finished, and tested with the utmost care before being sent out to the purchaser. We do not make the cheap rubbish sold by some firms as aero-models, which invariably disappoint the customer, but what we do make is the "Mann" monoplane, a scientific model which is the product of many years of arduous experiment, and which, in addition to 24 highest awards in open competition, holds world's records of

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Correspondence.

The Editor of The Aeroplane *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* The Aeroplane, 166, *Piccadilly, W.*

The Prevention of Future Accidents.

Sir,—I am sorry to say that I can hardly agree with Mr. Flanders when he advocates the formation of a competent authority to examine and pass aeroplane designs, my reasons being, firstly, that outside the trade such authority is not obtainable; secondly, that many constructors, myself included, would object strongly to divulging designs which are still in the drawing-office stage; and, thirdly, that such an authority would have a tendency to standardise its own pet methods of construction, which would seriously handicap individuality.

Let us see what the law of this country does in the case of murder, a crime to which the building of unsafe aeroplanes bears a very close resemblance. The law takes no preventive measures; it does not insist that his Majesty's liege subjects shall wear a waistcoat of steel mail, passed by a competent authority, as being proof against the dagger of an assassin, and, as murderers are generally given to keeping their intentions to themselves, even the ordinary policeman is in this case very little use.

But once let the murder be committed and the law rouses itself energetically, it stimulates every policeman in the country into hunting for the culprit, and when, if ever, he is caught, he is fully able to appreciate the maxim that the way of transgressors is hard.

This is precisely how I should treat this problem. When the aeroplane has given way in the air, and when the aviator has been killed, or seriously injured, I would visit the incapable manufacturer with the penalty of publicity, which is the severest penalty it is possible to impose.

This method also has the advantage of making it much easier to find the necessary authority, as it is far easier to find a man who is capable of deciding as to whether a part has fractured, than to find a man who is capable of deciding whether a part is likely to fracture.

W. O. Manning.

Sir,—To my mind, the simplest and easiest way of finding out if aeroplanes are sufficiently strongly built is to invert them and load the planes with a liberal allowance of sand—say three or four times the actual load upon them—and note the results.

It would not be an expensive matter to erect a scaffolding at the chief flying centres capable of dealing expeditiously with any present-day aeroplane.

This test does not favour the aeroplane when the machine is inverted, for the weight of the planes themselves between the supports helps to increase the load, whereas in the air they help to reduce it; and likewise the weight of the whole plane area is carried on the bracing when inverted, and helps to reduce it when flying in the air.

A. V. Roe.

The Air Battalion.

Sir,—I enclose the following cutting from to-day's *Western Morning News*, thinking it may be of interest to you, especially the parts underlined :—

EXPANSION OF AERO CORPS.

The Director of Personal Services at the War Office is inquiring through the General Officers of Commands if there are any captains or subalterns of the Royal Engineers who would like to serve with the Air Battalion, R.E., for work with (a) captive balloons and kites, (b) airships, (c) aeroplanes. The wishes of officers desirous of undertaking any particular branch of air-work are to be met as far as possible. *There are, however, but few vacancies as aeroplane pilots.* Officers taking up captive work will also have the opportunity of learning the management of airships, but *no promise will be made that they will be transferred to the Aeroplane Company.* The possession of a pilot's certificate is not necessary.

Presumably, if this is correct, the Government, while buying machines to placate public opinion, have no intention of training pilots to fly these machines.

Is it not time that something was done to expose this duplicity? A national protest would seem to be the only way of making the voice of the people heard, now that the House of Commons is impotent.

E. F. L. Taylor.

Plymouth.

[Evidently the War Office advertisement has been well distributed. However, the daily press cares little or nothing about aerial defence, so it is to be feared that nothing much can be done till Parliament reassembles.—Ed.]

The Hemispherical Entry.

Sir,—It is now known that the most efficient form of aeroplane body is that constituted, essentially, by a hemispherical front, with the convexity outward, followed by a trunk of circular section, which diminishes to a point at the tail.

Certain constructors in England and France, who have realised the overwhelming importance of this form of body, have begun to use it, and its initial employment in design has been wrongfully attributed to them.

I wish to draw your attention and that of your readers to the fact that an aeroplane, called the "Crucifer," with this form of body (the shape being allowed in the claims), was patented by me in Great Britain in April, 1909, and, a year later, under the International Convention, in various foreign countries, including France, and also in several of our own Colonies.

Will you be good enough to publish this letter, so that my priority and rights in this matter may be duly recognised.

Hayward's Heath. L. Beauclerc Goldman.

[It will be well if British constructors who are thinking of employing the form of fuselage originated in Mr. Goldman's "Crucifer" aeroplane, and now adopted by the Borels, and Morane and Saulnier, will make a note of this letter, and will communicate with Mr. Goldman.—Ed.]

Fogless Shoreham.

Sir,—In The Aeroplane of last week, under the heading of December 29th, in the paragraph on Brighton-Shoreham Aerodrome you use the words at the end of the paragraph: "Weather rest of week calm, but too foggy for school work."

The reason the Chanter School was not out the early part of the week was that they had closed down for the Christmas holidays. As you justly state, on the 30th and 31st there was flying. We shall esteem it a favour if you would correct the error, as this gives a wrong impression of the ground. Thanking you in anticipation,

William Pettett, Secretary.
(For Aviators' Finance, Ltd.)

[The report came from a correspondent who is usually reliable, though it seemed strange at the time that there should have been fog at Shoreham, where there hardly ever is any fog, when it was quite clear in London.—Ed.]

Oil on Troubled Waters.

Sir,—From many points of view it appears desirable that designers of aeroplanes should turn their attention to the production of a machine which is capable of rising from and alighting upon water.

Several hydro-aeroplanes have recently accomplished this upon the smooth surface of rivers and lakes; but if such machines are to be of any real value to the Navy they must be able to rise from open water in moderate breezes.

It occurs to me that a smooth surface of considerable size might be produced under the lee of any large ship by the use of oil, properly applied in accordance with the excellent advice given in the relative Board of Trade publication for the use of mariners, and it would be interesting to know if anything of the kind has been tried.

Such a surface would not, of course, be completely still; but it would, at any rate, be free from breaking water, and in moderate weather, with an aeroplane attached sufficiently rigidly to the necessary floats, it should be possible to launch the machine without undue risk to the pilot.

May I, in conclusion, congratulate you upon the all-round excellence of The Aeroplane?

Brighton. S. N. Neild.

The Modern Aero Club Movement.

Sir,—As one keenly interested in the above movement, may I be permitted to make a few remarks relative to "Aero-Aspirant's" article in your issue of January 4th.

In the first place his figures are inaccurate, as I know *personally* of the (present) existence of forty-four such clubs—I have the list by me as I write—and I most certainly do not pretend to know them all. I do not lay any especial point on the exact number, but it is as well to be as accurate as pos-

sible. Moreover, at the present time new clubs are constantly being formed. I receive from two to three letters weekly relative to such.

Granted that there are only about half as many clubs now in existence as have actually been inaugurated, I do not see in this the least reason to take a pessimistic view of the situation. There is always this set-back more or less nowadays when any new movement is inaugurated.

The true test of the success or non-success of the movement lies in the *future* not the *past*. As to whether it is to be a success or failure, and as to how the one is to be attained and the other avoided, no doubt plenty of discussion will arise as the direct result of "Aero-Aspirant's" remarks (with many of which I agree), which I trust will do something to make the aero-model movement the former, and not the latter.

Streatham, S.W. V. E. JOHNSON.

[Mr. Johnson refers exclusively to model clubs, whereas "Aero-Aspirant" presumably intended to include all aero-clubs in his indictment. One would like to hear something of the state of clubs for both models and full-size machines from the secretaries of successful and unsuccessful clubs.—ED.]

The Air-Craft Factory's Effort.

Sir,—*Re* the paragraph headed "The Aircraft Factory's Latest" in this week's AEROPLANE, I do think you might give credit where credit is due.

I happen to know something about the latest product of the factory, and consider it an excellent machine.

It is very fast, certainly one of the fastest, if not *the* fastest biplane existing. It has an excellent gliding angle, and climbs very well: as for the silence which you seem to rather ridicule, it is of obvious importance for a military machine.

The witticism (?) about the factory smoking is surely not worthy of the Editor?

As for the machine being "an attempt to copy the Avro and the Bréguet, it is certainly better than the Avro and considerably faster and less clumsy than the Bréguet.

Heaven knows the A.A.F. is pretty bad, but when a decent machine *is* turned out why not give the designer a little credit? After all, the designer has nothing to do with the management.

"FAIR PLAY."

["Fair Play's" letter is interesting and worthy of its writer, who is a thorough sportsman. The jest to which he takes exception was to the address of the writer of the paragraph quoted. Far be it from THE AEROPLANE to ridicule silence in a military machine, for silence is a most important attribute. But, so much fuss has been made about the silence of this particular machine that readers of the daily press are apt to think it is the first machine ever fitted with silencers. It is, at any rate, good to hear from one whose opinion is worth having that the machine is good, and that the British taxpayer has got something at least for the tens of thousands of pounds expended at Farnborough.—ED.]

Sir,—You will excuse me troubling you, but I have just read a paragraph in your latest number which I feel I cannot let pass without a protest. I refer to the paragraph on page 6 headed "The Aircraft Factory's Latest."

Why you took it upon yourself—you who, I presume, have the interests of aviation in general and the Air Battalion in particular to a certain extent at heart—to criticise in the most offensive manner the latest production of the Aircraft Factory passes my comprehension. The new machine may or may not be a success, but it is, at any rate, the outcome of much thought and experiment on the part of the earnest workers who produced it, and to print a paragraph in the tone of the one in question is the acme of foolishness, and the deliberate reverse of the encouragement which British aviation, Heaven knows, still sadly needs.

To emphasise the fact that the observations you make on the extract from *The Times* are wholly offensive and not in the nature of fair criticism, let me take them one by one. You open by referring to the grammar and haziness of the extract, which, personally, I fail to notice. You then proceed to introduce superfluous and out-of-place sarcasm with regard to the last few words (or so I imagine it to be, for I take it as hardly possible you could really be in doubt as to the meaning of the sentence). After which, in the same strain, you say that "smoking is prohibited near balloons," which is in itself not in the least apropos, as there are no balloons inflated at the factory.

After this you at last come to the machine in question, and, presumably with the direct intention of casting aspersions on the new arrival, you suggest that it is a copy—which may or may not be true, but surely is no very great failing—and that the "silencer" is no new device, which surely has nothing whatever to do with the question. The paragraph seems designed to criticise adversely, presumably on principle, the Army Aeroplane.

So strongly do I feel on the subject that I intend, after buying next week's issue to see whether you have the courage to print this and refute the accusations, to give up taking in your paper, which I have had for some time.

Farnborough. F. R. EAGAR.

[See note to previous letter. It is occasionally necessary to chaff passably good things because of the undue importance given to them by an unenlightened Press. The latest Farnborough product is doubtless good enough in its way, but it is not the epoch-making advance in aerodynamics which the daily papers seem to think it to be. If the lay Press could be induced to give as much of its space to the products of hard-working aeroplane constructors who have built dozens of successful machines as it gives to the doings of the State-supported Aircraft Factory, which has only made one decent aeroplane, aviation in this country would be in a much better position. Mr. Eagar's local patriotism is to be highly commended, and his promised self-denial in future is a credit to his feelings.—ED.]

A Question of Nationality.

Sir,—I understand that only pilots of French nationality were allowed to compete in the recent French military trials.

Weymann competed. He also won the Gordon-Bennett race for *America!* How did he become an American and then a Frenchman? J. ROBINSON.

Matters of Fact.

Sir,—I have just been reading Miss Bacon's book, *How Men Fly*. It is really very interesting, and should appeal to the average man who knows little or nothing of aviation, its language is so simple; but might I point out two mistakes which perhaps can be corrected in future issues?

On page 81 I will quote the authoress:—

"The Wright machine which, as we have seen, is a very fine glider, can glide down at an angle of 1 in 8; the Breguet biplane can manage 1 in 12; but the Nieuport gliding angle is 1 in 20. It is claimed for this monoplane that if the engine stops at a height of 1,320 feet the pilot can choose his landing-place inside a radius of five miles."

Would it were only true, but I have yet to learn of a machine which will manage 1 in 6.

On page 98 Cecil Grace is written of as disappearing into the sea on his Blériot; to the best of my recollection, he was flying a Short machine at the time.

Cambridge. HARRY VOSS HALL.

[The gliding angles mentioned are those claimed by the makers, and, under favourable conditions, are just possible, though the Wright is perhaps better than claimed. The statement about the late Cecil Grace is one of those obvious errors into which the best writers fall at times.—ED.]

Letters on Design.

Sir,—I feel sure you will allow me a few lines, in the interests of aviation, to make a suggestion as to improvement (?) in the design of present-day aeroplanes, although, probably, most of your readers and you, yourself, will disagree with me.

My suggestion is that the centre of thrust in any aeroplane should be situated above the horizontal plane of the centre of gravity.

Unless I explained farther, I feel sure the Editor would have informed me at the foot of this letter that if the centre of thrust were so placed, the machine would have a tendency to dive, which would have to be counteracted by tilting the elevator, with the resultant resistance and consequent loss of efficiency.

Now, surely, in the non-lifting tail machine which the Editor advocates, this, with its centre of gravity far forward, would have a tendency to dive, and would, therefore, be open to the same objections.

The superiority I claim for the former method is that the machine could have its centre of gravity fairly far back, and a gliding angle of something like 1 in 20, and therefore in the event of a sudden engine stoppage at, say, 3,000 feet (the minimum height at which a military aeroplane may fly), the machine would glide something like eleven miles after its

motive power had failed, within which distance the pilot could certainly choose a good landing-place.

Another point in favour of placing the propeller higher, is that the machine, as a whole, could be placed nearer the ground, and possibly no chassis would be required; the wheels being fitted to the fuselage, which would be a considerable saving in weight and head resistance.

I cannot close my first letter to your excellent journal without saying how much I appreciate it, and wishing it further success. "Neugierige."

["Neugierige" misses several important points. Firstly, whether a machine has a tendency to dive or not depends on the position of the centre of gravity in relation to the centre of pressure. In order to fly at all the two must be coincident, though, in the majority of machines, they are only made so by the variation of the longitudinal controlling surfaces by the skill of the pilot. In a lifting-tail machine the centre of pressure and centre of gravity are both further back than in the non-lifting type, but this does not affect the tendency to dive, either up or down, because both must be in the same place, in order to fly at all. The danger of the lifting tail lies in the fact that the slip-stream of the propeller gives it more lift than its flying-speed alone would do, and consequently when the engine stops the tail drops.

In the machine advocated by "Neugierige" the fact of the thrust being high up would, as he says, try to force the nose of the machine down, therefore it would be necessary to have a depressing tail, which is dangerous for several reasons. In the first place, directly the engine stopped the depressing tail would throw the nose of the machine up, it would lose way, and get absolutely out of control. The first thing taught to a pupil-aviator is that if his engine stops he must at all costs get the nose of the machine down, so as to force her to dive, and so get up sufficient speed, owing to the force of gravity, to keep under proper control, speed being as necessary for steerage way on an aeroplane as on a ship.

Secondly, with a depressing tail, if one takes a corner sharply with a steep bank, the pressure on the top of the tail is liable to throw the tail outwards instead of downwards, so making the turn sharper and sharper, increasing the bank, and finally causing a side-slip, which, owing to the depression on the tail, cannot be converted into a dive—the only way of saving a smash.

If the machine were built with a depressing tail, and the centre of gravity far back as well, it would be utterly impossible to control it at all.

Further, the variation of the centre of gravity has nothing to do with the gliding angle, except to upset it, when once it has been got right. Unfortunately for "Neugierige's" argument, the best gliding angle of any machine in the world belongs to the Nieuport, which has a non-lifting tail, and the next best are probably the Bréguet, Bristol monoplane, and the Wright.

If the nose of the machine threw up instead of down when the engine stopped for a glide, and the pilot kept the tail up enough to prevent it from falling back, the whole machine would pancake, and make more vertical way downwards than forwards.—Ed.]

Sir,—I was very interested in the letter of your correspondent, Mr. T. R. Waring. I have myself for the past two years been trying to make a machine that will fly with a 9 h.p. engine. My first machine had a spread of 26 ft. by 6 ft. chord, and a leading plane 12 ft. by 3 ft. chord, also an elevator 8 ft. by 2 ft. chord, the total area being 196 sq. ft. and the total weight, less pilot, 240 lbs.

I pin my faith to the Manx or "tailless" type, as, with a leading plane, one can get a greater amount of carrying surface for the same span, whereas to load the tail of an ordinary tractor monoplane to any extent is to make it unstable.

Then, again, it is regarded as inefficient to set the leading plane of a Manx-type aeroplane at a greater angle than the main planes, although it gives stability, so of the two evils I prefer to choose the latter.

I had bad luck with my first venture, inasmuch as I managed to smash it up in its preliminary tests, but nevertheless I saw where improvements could be made that would increase my chance of success, and these I have embodied in a machine which I hope to test in a month or so.

I feel confident, from the little experience I have gained, that it is possible to make an aeroplane that will fly with 9 h.p. My idea of this machine is one having a spread of some 30 ft., not less; a leading fixed plane, and, of course, an elevator. Total area, about 240 sq. ft., and total weight, less pilot, 300 lbs. This would necessarily be a slow machine, but when once induced to fly could be improved upon as regards speed.

Like Mr. Waring, I am waiting patiently for the day when our designers will turn their attention to an aeroplane that will fly with a low-powered engine. I think, to an amateur, so much depends upon the propeller he can design and build. It is a beautiful little problem for a novice to tackle.

Could any of your readers give me an idea of the possible thrust obtainable from 9 h.p., or, perhaps, better still, the results of actual tests with spring balance, or other means of measuring the static thrust, as I am anxious to see how my latest production compares with results usually obtained? I use a propeller of large diameter and reducing gear; this adds to the weight, but much better results are obtained.

With reference to variable surface machines for muscular pilots,—why not this idea? I believe it is in use at the present time with the pigeon family.

Cheltenham. Harry Higgins.

Sir,—Could you assist me to solutions of the following?

I want a monoplane to fly 70 m.p.h. minimum.

Its chord is 6 feet. Its maximum camber 18 inches from leading edge.

First, with a total weight, loaded, of 1,500 lbs.; second, with 1,600 lbs.; third, with 1,700 lbs.; fourth, with 1,800 lbs.; fifth, with 1,900 lbs.; sixth, with 2,000 lbs.

In order to get a gliding angle of 1 in 6 in each case—What should be the maximum camber? What should be the angle of incidence? What should be the area of the main plane?

The head resistances which I have calculated are: The body (or fuselage), at 70 m.p.h., absorbs 4 h.p., the chassis (or carriage), 3 h.p., in all cases.

As all the load, including engine, is enclosed by the body, the only other resistance to be calculated is that of the main plane, when its area is arrived at. The horse-power which will be required to carry the loads through the air at the determined camber and the determined angle of incidence of the main plane, for a speed of 70 m.p.h., is another matter.

Could you tell me, also, how far from the leading edge I should place the centre of gravity to accord with the centre of pressure?

H. N. Parkinson.

[It is rather hard to tell exactly what Mr. Parkinson really wants, for he is all at sea in the relations of the various quantities he names. It is to be hoped that he will not attempt construction until he has learned more about design. Firstly, it may be as well to inform him that if he has succeeded in reducing the power absorbed by his chassis and fuselage to as low as 7 h.p. for a machine to lift 1,500 lbs. at 70 m.p.h., he has achieved something like a miracle. The present-day figure is in the neighbourhood of 30 h.p. However, if it is as he says, then the gliding angle and angle of incidence will be practically equal, i.e., 1 in 6. With 6 feet chord and angle of 1 in 6, his camber should be about 4 to 5 inches (to the centreline of the section). The necessary wing surface for planes to lift his loads are: 1,500 lbs., 275 square feet; 1,600 lbs., 293 square feet; 1,700 lbs., 311 square feet; 1,800 lbs., 330 square feet; 1,900 lbs., 348 square feet; 2,000 lbs., 366 square feet. The centre of pressure at 1 in 6 will probably be between 2 and 3 feet from the leading edge, the exact point depending on the camber. I do not gather whether Mr. Parkinson also wishes to know the h.p. required, but I give it. The horse-power necessary to lift the weight at the speed is 47 h.p. for 1,500 lbs., and 3.1 h.p. for each extra 100 lbs. To this must be added the horse-power to overcome head-resistance, which Mr. Parkinson estimates so lightly. Unless he has ideas capable of revolutionising present streamline design, he will need at least 50 h.p. for this purpose alone, the extra 20 h.p. being expended on the useless resistance of wings and tie wires, i.e., about 100 h.p. in all. My serious advice to him is: If he wishes actually to design a machine for construction, let him learn, from as many sources as he can command, the principles used by designers, and study them for some considerable period (two or three years) before endeavouring to build a machine.—P.K.T.]

Sir,—A correspondent, in a recent letter suggesting a wing cambered in its length in much the same way as in its width, suggests a fact which I have never seen any comment upon. This is that the strength of the wing is very materially increased by its camber.

I have verified this, incidentally, by experiments with paper models. I have found that, though it is impossible to make a flat paper plane sufficiently strong without some stiffening "spar" (even then the flat plane necessitating stiffer paper), a cambered plane can be made quite sufficiently strong from

the flimsiest paper, such as ordinary newspaper. The apparent neglect to mention this fact I have been tempted to think either due to its obvious nature or to the fact that the full-size machine is not subject to the same conditions.

Surely, however, the two (the paper wings and the real machine) are analogous to some extent; and I notice, too, from your illustration of the Paulhan "torpedo," that the wing of that machine is not only not cambered in its width but is bent upwards in its length in a way which (or I am quite wrong) would render it less liable to break if it were flown upside down.

I may mention that I have also noticed that the strength of a paper cambered wing lies in its resistance to an upward push, the slightest air resistance to the upper side—such as is caused by an upward jerk—being sufficient to buckle it.

The question, then, that I should like to put is: Does the camber increase the strength of the wing? I have some recollection (as a very superficial student) of complicated diagrams explaining what the air does when it meets the cambered plane (or *vice versa*), but, personally, my view of the use of the camber in that respect is that it grips the air as it is dispersed by the impact of the plane. An oar blade is cambered, I take it, for the same reason. May the camber be taken to serve a purpose in this other direction?

Wandsworth. F. A. G.

Useful Model Work.

Model flying has descended lately to such a low ebb that responsible persons are beginning to wonder whether there can be in it any effect whatever, except to induce megalomania in immature youths. It is curious that a study so instructive, as it is even to the ablest of designers of full-sized machines, when pursued individually, should be so useless when large numbers take part in it together.

The main cause of the failure is, of course, that competitions involving huge distances and duration compel model-makers to devote their whole efforts to propulsive efficiency, instead of dividing their mental resources among the other equally important subjects. Nevertheless, there is much that may be learnt by the use of flying models.

The results of experiments would, of course, be much more directly useful if there were only some form of motive power more satisfactory than india-rubber. India-rubber, it must be admitted, is a splendid method of storing energy for this purpose, but it suffers from the defect that it cannot give out its energy at anything approaching constant power, and that it cannot be employed in any form of weight distribution even roughly resembling that of the petrol motor; so that all results obtained on models with elastic motors have to be most carefully examined before one can expect that they will work out in practice with petrol motors.

I propose in these columns to devote a certain amount of space each week to the discussion of model making and flying, and to try and show how this work can be made useful with a view to full-size work.

There are one or two general considerations which must be looked at to begin with. First, however many persons assist at the making and flying, only one model should be experimented with at one time. If there are more, sooner or later a competitive spirit is bound to be shown, and this will infallibly destroy any chance of learning anything useful. Secondly, the experiments should always be made in the same place, and this place should be studied most carefully in an endeavour to find out what are the peculiarities of the air currents which are found in it under various atmospheric conditions. When this has been discovered one will be able to observe the effect of these known air currents on experimental models. Thirdly, the model must be of a rather peculiar type. That is, it must be possible to remove any one part of it and substitute a corresponding part of different design, so that one may compare two flights of machines exactly similar excepting only for one particular point.

One very necessary point in all this work is strength and rigidity of construction. In a machine such as an aeroplane, wherein everything depends upon relative angles, the slightest give in the planes themselves or the framework will upset the relative arrangement of the planes and stultify the results.

Next week I propose to give a list of the necessary alterations produced in the various quantities involved by a given change in the size of the machines, after which I propose to devote space to the construction of a frame and planes suitable for experiments. After this, I shall deal with the subject of designing planes, etc., for use under various conditions, and will then take up the subject of propellers.—P. K. Turner.

The Commercial Mann Model.

The Aeroplane has received from Messrs. Mann and Grimmer copies of the pamphlets which the firm has had prepared. These are distinctly interesting, and it is to be hoped that their circulation will be large, for whatever may be one's own opinion as to the usefulness of bought models, the "Mann" is among the very best now for sale.

The firm has also instituted a prize scheme, offering £5 to the purchaser of a "Mann" model, or set of parts for same, who wins most prizes with it during 1912.

A Well-Established Firm.

Mr. S. Summerfield, of Melton Mowbray, who has now been in the aero-model business for over two years, sends his list of models and materials. The prices are low, and the quality, to the personal knowledge of the writer, is very good. His list should be procured by all model builders.

A Correction.

By an unfortunate typographical error it was made to appear in the advertisement of Willis Bros., of Hastings, last week, that the firm are selling all sizes of elastic at 10d. per dozen yards. As a result Messrs. Willis have had numerous requests to supply rubber at an impossible price and in impossible sizes. The correct reading should be ¼-in. rubber at 1s. 5d. per dozen yards; 3-16-in. rubber at 1s. 3d.; and ⅛-in. rubber at 10d.

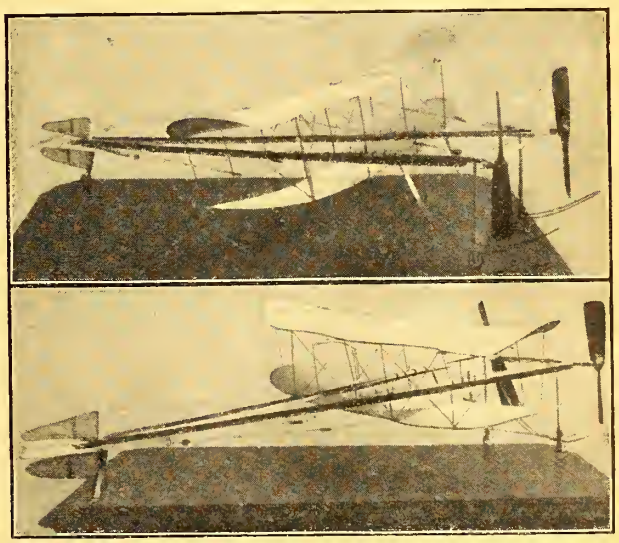
MODEL CORRESPONDENCE.

A Tractor Biplane Model.

Sir,—I enclose two photographs of an 0—2T—2—1 floating-tail biplane which I constructed recently.

The dimensions are: Length, 42 ins.; spread, 36 ins.; surface, 3 sq. ft.; aspect-ratio, 12 to 1.

Tractor-screws: Diameter, 9½ ins.; pitch, 16 ins.; speed, 2,500 r.p.m. Total weight of rubber, 2⅞ ozs. Weight of model, 16 ozs. Wings and skids, 16-gauge piano wire.



This machine rises from the ground in a very short distance; on one occasion in less than 2 ft. The duration (20 seconds) is, however, not sufficient for satisfactory tests, and I am now rebuilding the machine with a streamline fuselage and an "Ideal model turbine," from which I expect good results.

The speed of the screws, which are built up from satin walnut, is admittedly excessive, and I intend substituting for them 15-in. propellers. Their efficiency is probably due more especially to the streamline form of the blades.

Experiments with various types of propellers point to the fact that the secret of efficiency lies in large diameter and slight angle of incidence. This is the strongest argument in favour

of helicopters, where the thrust can be practically static and the pitch low.

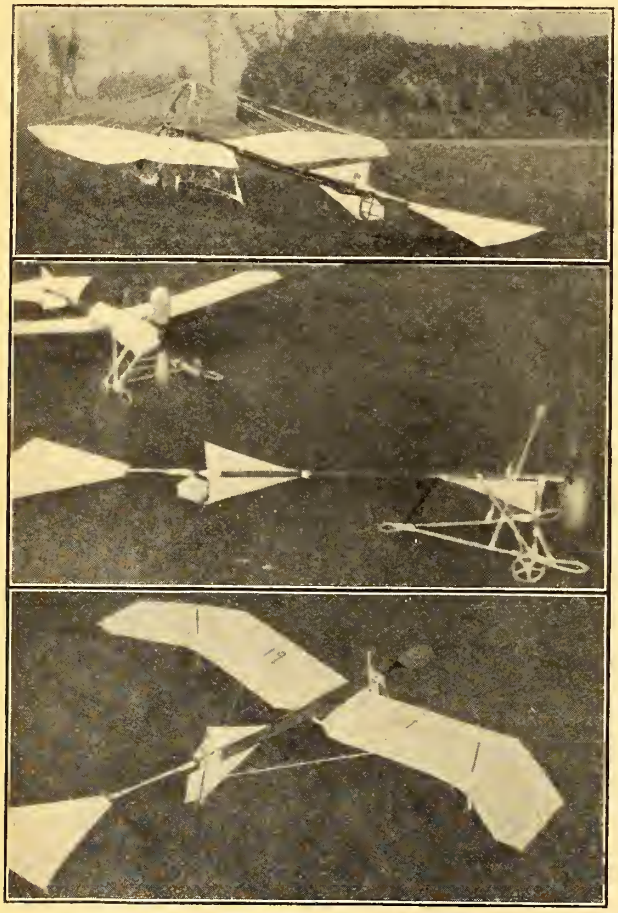
I notice that on page 643 of Vol. I. you invite suggestions for reasonable model competitions. I cannot see any necessity to hold them at all. We want to found a science of model flying, not a sport! The scientist always prefers his notebook to an "official observer."

R. V. Tivy.

[Mr. Tivy's final remark is worthy of deep consideration by Aero-Model Clubs. Flying-stick competitions are absolutely devoid of any value.—Ed.]

A Tractor Model.

Sir,—The enclosed photograph is of the very latest product of my model workshop. It behaves itself very well in the air, and terrifies all the chickens in our neighbour's field, which is my aerodrome.



The curious hump noticeable on each wing in the photo is not really there—it is due to the wings sloping backwards at their extremities. I think when in good trim this machine will be as successful as any I have yet made.

The dimensions are as follows:—Span 56 ins., chord 9 ins., propeller 14 ins., made by J. Bonn and Co. Flies 60 to 65 yards. Rubber, three skeins, supplied by Bonn and Co.

Sydenham. Lancelot L. Vigers.

CLUB NOTES.

N.B.—Club Notes must be posted to 166, Piccadilly, to arrive not later than first post Monday morning, and should be as brief as possible.

Paddington and District Aero Club.—General meeting on January 3rd. Membership increasing rapidly and club promises to be one of strongest by next summer. Has large private flying ground and workshop at very little cost to club, enabling considerable funds to be devoted to prizes. For convenience of members who have little time, sub-committee have been appointed to obtain an additional ground nearer Paddington. Special prizes offered for models made in club workshop. Already twenty entries. Club exceedingly convenient for Harlesden, Willesden, Wembley and Harrow. Anyone interested asked to write or call on Secretary, W. Evans, 133, Buchanan Gardens, College Park, Harlesden.

Brighton and District Model Aero Club, 36, Little Preston Street.—General meeting held on 6th, and rules of next Saturday's (13th) point-to-point competition discussed. Five prizes now up for competition. Mr. Townsend has offered two prizes of £1 and 10s., and Mr. Barnett promised gold medal for flight which creates most public interest. Mr. Bate has offered prize for quarter-mile flights, and Mr. Burghope one for first machine to leave water.

Birmingham Aero Club.—General meeting.—Headquarters were fixed at Bell Hotel, Philip Street, off Bull Ring. Weston, Hurlin & Co.'s offer of model for competition was announced, and it was decided to put this up for junior section. Following officers were elected: Messrs. R. Cobham and G. Haddon Wood, Joint Hon. Secs.; R. Platts and E. Trykle, Joint Hon. Treasurers; F. Hill, Chairman; and B. W. Beeby, Vice-Chairman. Resolution passed that Lord Norton, who has already shown interest in aviation, and is a Vice-President, be asked to accept Presidency.

Aero-Models Association (Northern Branch).—Members' social to be held at 15, Highgate Avenue, N., on 13th, at 7p.m. All interested cordially invited. Model flying meeting on Sat., January 20th, at club's flying ground in Bisbop's Avenue, East Finchley, N. (Viver's Lodge Dairy Farm), at 3 p.m. sharp. Competition for distance, no entrance fee for members or non-members. Messrs. R. G. Corder & Co. have very kindly offered a prize of model aeroplane goods to the value of 5s. Intending competitors please notify Secretary, Malcolm B. Ross, 15, Highgate Avenue, N.

Worcester Model Aero Club (Victoria Institute) — First competition on January 6th. Seven machines did good flying. Results:—Distance, Pollard; duration, Pollard, 15 secs.; stability, Davis, 10 marks. January 13th, further competitions. Secretary pleased to welcome new members. Subscription of 6d. per month admits to meetings and participation in ordinary competitions.—Stanley A. Sears, Hon. Sec.

Ealing Model Club.—Model enthusiasts in Ealing district arranged small demonstration on 7th. Flights up to 300 yards obtained. After flying it was decided to form club. Readers of The Aeroplane in this district are asked to communicate with Mr. D. C. Line, of 53, Grosvenor Road, Hanwell, or B. J. Kirchmer, 1, Queen's Gardens, Ealing, Joint Secretaries (pro tem). Flying meeting to be held at 2.30 p.m. next Saturday, 13th, at field near crossing of Pittshanger Lane, and the continuation of Argyle Road; footpath to Perivale runs across field. After meeting, inaugural meeting of club will be held, at which committee will be elected and rules drawn up. Club will be exclusively amateur.

Blackheath Aero Club—On January 4th, first model exhibition. Excellent attendance. Mr. A. C. Horth was present. Steam driven models shown by A. W. Myles and H. H. Groves, both excellent flyers. Former exhibited model "Antoinette," fitted with 3-cylinder rotary engine, driving 10 inch tractor. New "tail-first" monoplane shown by Mr. Groves undoubtedly centre of attraction. Engine is 2-cylinder horizontal opposed, giving approximately ¾ H.P. at 1,600 r.p.m., 16 in. propeller giving thrust of 1 lb. for one minute, gradually falling to 8 ozs. at the end of 2 minutes. Weight of engine only 3½ ozs., power plant complete 2 lbs. 1 oz. Total weight of model complete with fuel and water 3½ lbs. Mr. J. H. Dollittle exhibited twin-tractor monoplane and 3-cylinder rotary engine and Mr. H. J. V. Stevens his 2-cylinder (vertical) steam engine. Biplanes shown by Messrs. L. Brough and A. B. Clark, and scale Bleriots by A. E. Collins and A. B. Clark. Rubber driven monoplanes shown by Messrs. Whitworth, Woollard, Plummer, Brough, Pizey, Holland, Egelstaff, Trask and Thompson. Committee hope to arrange a similar exhibition at early date, probably at Catford.

On Jan. 13th at 2 p.m. at Kidbrooke, open competitions for cup. Intending competitors should apply to A. B. Clark (Hon. Sec.), 196, Brockley Road, Brockley, S.E.

Edinburgh Aero Club.—This is not going to be a model club, as there is an impression that it is so. Club has offer from Mr. Gibson, of Leith, who has already built nine machines, of his last machine, a biplane with 30 h.p. Alvaston engine. He has offered to turn it into an engine-in-front type as that is the general wish.

Club has also got use of aerodrome near.

It is intended that first 20 members pay 2 guineas subscription. These members will have use of machine and glider, paying for petrol, etc., also for any smashes done.

There will also be another class where subscription will be, say, 5/-, with use of glider only.

Club intends to hold numerous lectures, etc., to get people interested up here, and with plenty of energy club should be a success.

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THE AEROPLANE

1D WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

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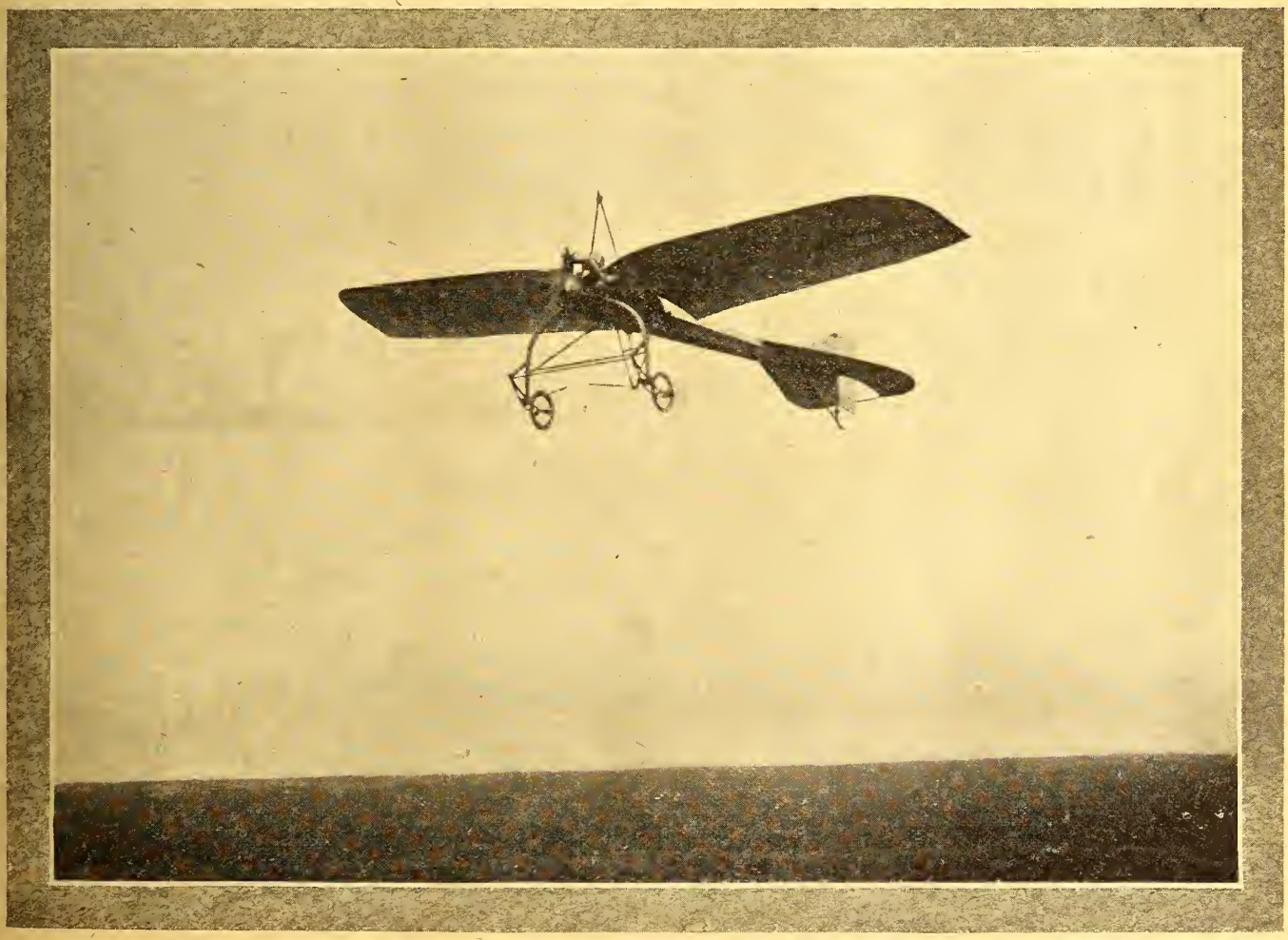
AN ORIGINAL MACHINE.



The little Vendôme monoplane flying at Issy with a Viale engine. The chassis, wing form, fuselage and empennage are all quite distinctive.

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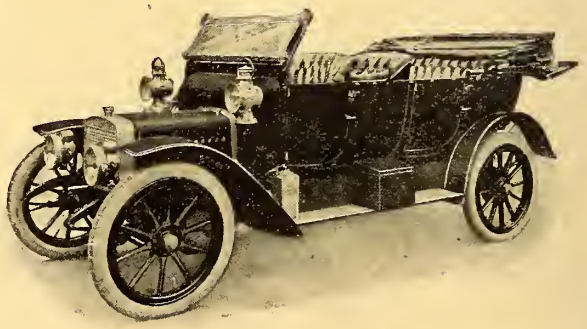

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Practical Naval Aviation.

On Thursday last it was announced that Lieutenant C. R. Samson, R.N., of H.M.S. *Actæon*, who is one of the three naval officers who have been studying aviation at Eastchurch, had flown from Eastchurch to Sheerness, and had there had his machine conveyed to the deck of the battleship *Africa*, whence he succeeded in flying from a staging erected over the bows. This is, of course, the first time an aeroplane has succeeded in flying off a ship belonging to this country, but the feat is not a new one, as it had already been done by the late Eugene Ely in the United States.

Now that this feat of Mr. Samson's is made public, The Aeroplane is at liberty to state that quite a large amount of experimenting has been going on round the Isle of Sheppey with Short biplanes fitted with floats, and that on several occasions Lieutenant Longmore, R.N., has flown to Sheerness Harbour and alighted on the water, afterwards flying back again to the aerodrome. On at least one of these occasions he has stopped his machine within a few yards of the *Actæon*, gone on board and returned again to his machine. These things, of course, show that serious work is being done by these pioneers of naval aviation, but it must not be thought for a moment that alighting with a large biplane in still harbour water, or getting a biplane off a large and clumsy platform built on the bows of a battleship, has any direct relation to naval aviation proper.

Aeroplanes operating on, over, and from harbour water belong to coast defence work, which is Army work strictly pertaining to Garrison Artillery and the Coast Battalion of the Royal Engineers. As has already been pointed out in The Aeroplane with considerable emphasis, the only possible naval aeroplane for use at sea is one which is launched from the ship by auxiliary power, and on returning alights on the water as near the ship as may be.

It is reported, without any corroboration, that Mr. Samson has the intention of attempting to alight on the deck of one of the battleships at Sheerness. It is sincerely to be hoped that he will not make the attempt, for he is not only one of the most magnificent flyers in this country, but he is an exceedingly valuable officer, and a man of very considerable mental ability, and should not, therefore, be permitted to risk his life on what is, when all is said and done, simply a dangerous trick which, though it may perhaps seem convincing to a few old-fashioned officers who do not yet realise even the present possibilities of the aeroplane, is actually of no practical value whatever.

It must be obvious to anyone who understands aviation that while it might be quite possible to land a 40-mile-an-hour biplane flying against a strong wind on the deck of a ship doing 20 knots against the wind, even if there happened to be something of a sea on, it must be absolutely impossible for a pilot of a 90-mile-an-hour scouting-plane to attempt to do so. And it is the 90-mile-an-hour machine which is going to be used for naval work, simply because the naval aeroplane has got to be used in very much stronger winds than is the military aeroplane, and, therefore, the average naval machine must be very much faster than the average army machine.

Quite apart from this, of course, the enormous biplanes on which the naval officers have been trained, though undoubtedly the fastest and most beautifully constructed machines of their type, are quite unsuited for naval work, and it seems, therefore, rather like waste of time to use them for anything except the training of pupils, that is so far as the Navy is concerned; and, of course, one realises that when the Short Bros. turn their attention to turning out small high-speed monoplanes they will do it quite as well as the best.

The writer believes that almost all naval men with practical experience of aviation are in agreement with him on this subject, and, therefore, it is to be hoped that the Admiralty will not follow the example of the War Office, and compel their aviators to waste their time and the nation's money on the type of machine which is useless for practical purposes in time of war.

Obviously the next stage in the development of naval aviation should be a series of experiments with various types of apparatus for launching machines from ships. In connection with this, those who visited the Aero Show at Olympia two years ago may recollect an ingenious launching apparatus shown, if memory serves aright, by Mr. Piffard. It would be worth while to investigate this piece of mechanism, and also to experiment with plain launching rails and a falling weight, for anything is better than the cumbersome and obstructive platform hitherto used. It is, however, satisfactory that, at any rate, the Admiralty is actually doing something, and it is only to be hoped that Lieutenants Gregory, Samson, and Longmore, R.N., and their fellow aviator, Captain Gerrard, R.M.L.I., will soon be joined in their work by others of the many naval officers who are already fine flyers.

Incidentally, it is good to note that those who were concerned with the construction of the Barrow dirigible fiasco were not successful in securing the interest of the Admiralty for their pet projects, to the detriment of the really valuable aviation work being done in the Isle of Sheppey.

The Aeronautical Society Elections.

Members of the Aeronautical Society are reminded that the ballot papers for the election of the First Associate-Fellow of the reorganised Society must be sent to 53, Victoria Street, Westminster, not later than January 23rd.

The list of candidates for the Associate-Fellowship is somewhat disappointing, even making allowance for the fact that they are the applicants remaining after a number of obvious ineligibles had been eliminated by the Council, for there are only thirty-five postulants for the honours, and of these several do not seem to possess the qualification that "Associate-Fellowship should be conferred only on those in responsible technical positions in the Aeronautical Industry, and on those who, though not professionally associated therewith, are known to be proficient in the Science of Aeronautics."

In the first place, the wording of the rule is somewhat astonishing, and one wonders how a Council, possessing such obvious intelligence as does that of the Aeronautical Society, ever allowed the word "Industry" to get into the rules. On the face of it the Society must not be openly allied to "trade" interests, or it can never be recognised as a learned society. Trade interests must be looked after at a later stage in our development by an Institute of Aeronautical Engineers.

The writer is the first to uphold the claim of the Industry to possess practically all the Aeronautic knowledge worth having in this country at present, and it would be a calamity if men like Messrs. H. Barber, T. W. Clarke, J. W. Dunne, Harry Ferguson, A. R. Low, W. O. Manning, Handley Page, Horace Short and E. T. Willows are not among its Fellows—let alone its Associate-Fellows—but the rule, as it stands, qualifies any crank or quack who can by sheer ability to talk get himself into a "responsible technical position," and persuade misguided members to vote for him. Under this rule, for instance, "Captain" Lovelace, once known at Brooklands, would be eligible for Associate-Fellowship, though one may assume that the good sense of the Council will always eliminate obviously unsuitable persons.

So far as one can gather, the Council, in nominating those at present before the members for election, have worked on the very right and proper principle that Associate Fellowship should, or at any rate may, be granted to those who have laboured for the development of aeronautics in the past, even though their efforts may not have been crowned with success—in fact, that the degree may be granted more or less *honoris causa*. This will account for the inclusion in the list of a few names whose owners may be regarded by the younger and more practically successful men as out of date, and even useless so far as future progress is concerned.

There are several names which are wholly unfamiliar to those whose interest lies purely on the practical side, and it appears that among these are the names of several members of the staff of the National Physical Laboratory at Teddington. Now, to the practical man the name of that institution is anathema, and it is regarded as a place where a number of highly trained and well paid young men waste their time and the taxpayers' money in finding new and expensive ways of obtaining useless figures discovered by the University of Kutchino in Russia and by M. Eiffel in Paris some years earlier. Nevertheless, there are among the staff several men who, if not practical, are, at any rate, in earnest, and who will, no doubt, in time, evolve many interesting scientific formulæ to show us why our machines have been flying for the last few years; and there comes a time in all industries when the process of development by rule of thumb—or trial and error—reaches its limit, and the hitherto unproductive scientist steps in and carries the practical man forward. Therefore there seems every reason to include a certain number of budding scientists, even if they are elected on the ground that they are "known to be proficient in the Science of Aeronautics," rather than because they have done anything in particular.

Another interesting group is composed of Army men, some having practical as well as scientific qualifications, who, even if they had not, would be useful as advisers to the practical men as to the purposes for which their machines must be designed.

There are also a few Naval men, whose names are chiefly known for their connection with the unfortunate fiasco at Barrow. These officers have undoubtedly considerable scientific knowledge of the problems of aeronautics, as apart from the practice of aviation. It is to be regretted, however, that none of the Naval men who, beside being good flyers, are doing actual experimental work in the Isle of Sheppey, have been put forward for election. However, being engaged exclusively on work connected with war material, which must of necessity be treated as secret, they could not very well place themselves in a position where the knowledge they have gained might be inadvertently made known through a scientific discussion at a meeting of the Society. None the less, for the honour of the Society, these first successful Naval aviators should certainly be among its Associate-Fellows, even on the understanding that they will not take part in its debates.

Taking it all round, the first list of Associate-Fellows, though small, is open to very little objection, and it is to be hoped that at the next election there will be found the names of many more men who have distinguished themselves by their proficiency in aeronautics, both in connection with aerostats and aeroplanes.

Army Aviation in the U.S.A.

The Aviation Corps of the United States Army is a section of the Signal Corps, which is under the command of General James Allen. Congress voted last year $125,000 for aeronautical work over the period beginning June, 1911, and ending June, 1912.

The Air Corps has in its possession five aeroplanes, including two Curtisses, two Wrights, and one Burgess-Wright, all of them being biplanes. There are also three small captive balloons.

Six Army officers hold pilots' licences, and form the Signal Corps Aviation School. They are Captains Paul W. Beck and C. de F. Chandler, Lieutenants R. C. Kirtland, H. H. Arnold, T. de W. Milling, and — Kennedy.

During the last summer the school was stationed at College Park, Maryland, but on November 29th last they moved into winter quarters near Augusta, Georgia. Taking into consideration the small number of machines and pilots, a considerable amount of flying takes place. Discipline in the United States Army being of the weakest kind, the corps is not much hampered by unintelligent interference from higher quarters.

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AIR CURRENTS.

A "Potted" Aviation Serial.

Here is a sample taken from a serial story in a paper which in mercy shall be nameless:—

"Then she opened the *Daily Mirror*, and there looked at her from its central page the merry, handsome, daring face of her own Little Boy Blue!

"He was seated in his flying machine, steering-wheel in hand, looking out from among many wires. His cap was on the back of his head, his bright eyes looked straight into hers, his firm lips—parted in a smile—seemed to be saying, 'I jolly well mean to do it.' Beneath was an account of him and a description of the flight he was to attempt on that day—across the Channel, circling around Boulogne Cathedral, and back. He was to start at two o'clock. At that very moment he must be in mid-air.

"Oh, Little Boy Blue! Little Boy Blue! You have a way of making hearts stand still."

* * * *

But why should the Lay Press have all this literature to itself? Here is The Aeroplane's contribution to the priceless wealth which is being piled up for Posterity:—

Round the Mulberry Bush: In Fifteen Flights and a Pancake.

By Fioretta Fountayne Penn.

Flight the Fourteenth.

Gwendolen realised that the train was moving.

(Oh, Goosey Gander, what would you have said to that Tube train—you dear, record-breaking, speed-limit-exceeding, astonishingly rapid Goosey! That Tube train, trundling from the Bank to the Post Office, Chancery Lane, British Museum, continually pulling up, going on, stopping again, with your beloved in it, Goosey dear, looking out of the window in a vain attempt to see something of London. Oh, Goosey dear, come out of it! It isn't your turn yet.)

Gwendolen quitted the train at the Marble Arch. A thought struck her, and she paused at the bookstall.

"Can you give me the latest thing on aviation? I am the heroine of an aviation novel, and the hero is an air-man (mind the hyphen, please, Mr. Printer!—F. F. P.), and I don't know a thing about flying except that it's most frightfully interesting and thrilling and romantic. So I thought if I got a book about it I could put in some bits about steering-gear and cross-currents, and lofty sentiments like 'Every good life given advances the cause——'"

"Tommy-rot!" said the bookstall boy. "You won't find piffle like that in the books. You take this, and write round it. It'll do you a treat."

He gave her a *Daily Mirror*—the high-toned girl had never seen a halfpenny paper before—and there looked out at her from its central page the merry, daring, handsome face of her own Goosey Gander!

He was seated in his flying machine, steering-wheel in hand, looking out from a forest of wires. His goggles were on the top of his sunny curls, his bright eyes looked straight into hers, his lips, parted in a seraphic smile, seemed to say, "You wait and see me knock 'em!" Beneath was a description of the flight he was to attempt that day—from the roof of Paddington Station to Paris and back. At that very moment he must be in mid-air. Oh, Goosey Gander! Goosey Gander! You have a way of making hearts stand still.

Gwendolen tried to hide her emotion by buying the *Daily Graphic*—and there looked out at her from its central page the merry, daring, handsome face of her own Goosey Gander!

He was seated in his flying machine——

[I beg your pardon, Miss Penn, but didn't you say all that before?—Ed. The Aeroplane.

"Yes, Mr. Editor, but it's such a beautiful piece of writing I don't think once is enough. It's an *exact* description of a snapshot of Gust——

"Hush! Yes, yes, I know, and it's very nice indeed. But he really is a very modest young man, and he finds these continual tributes to his personal charms most embarrassing. Couldn't you go on to the flying?"

"Oh, *very* well, then! Disagreeable thing!"]

Crossing towards Hyde Park, she saw a strange thing perched on the top of the Marble Arch. It looked like a great white butterfly with folded wings, and its body was a tangle of curly-wirly wires. "What is that?" she asked of a taxi-driver.

"That's an aeroplane. Just done a trip——"

[Excuse me, but can you tell me what make of machine this is?—Ed.

No, I can't. *My* business is high-pressure, internal-combustion, dual-ignition sentiment, and if you want a lot of tiresome technical details you had better get P. K. T. to write your next serial for you—so there!—F. F. P.]

"Just done a trip from Paddington Station to Paris—the day was so clear we could watch the whole flight with glasses—and was nearly back when a cross-current caught him, something went wrong with the steering-gear, and down he came—flop."

[You see, I *can* do it if I like!—F. F. P.]

Gwendolen felt her brain giving way. She had refused to marry him, for no earthly reason except to spin the story out for another instalment—and now she would never have the chance again. Goosey, Goosey Gander, whither will you wander? Up and down the aerodrome, and in your little hangar? Up and down the flying ground, and sailing round and round and round——

"He's all right, though," said the chauffeur. "Trust him! Called to the bobby to fetch the fire-escape. Here he is, coming down it!"

Then Gwendolen's heart began to beat again, and her limbs regained their power to move. "He is mine," she said. "I must go to him. He is my own Goosey Gander." She dashed wildly across the road, and the crowd fell back before her. "Give him to me! I knew he would never really get away from me—not even by aeroplane!"

[*Another astounding instalment will appear*——]

[Not in this journal!—Ed. The Aeroplane.]

M. L. Elliott.

The Enthusiast.

A plan goes glimmering through my brain;
I seize a lot of wood and things,
And so begin an aeroplane!

The wood is ash of finest grain,
With camber true I poise the wings,
My plan keeps simmering in my brain.

My wife expostulates in vain!
She talks of "cabbages and kings,"
I—babble of my aeroplane!

"Stability" and "stress" and "strain,"
The speed-effect fine "streamline" brings—
All these race madly through my brain.

I steal a 100 h.p. Green,
I screw it in with bolts and rings,
And then tune up my aeroplane!

My pride and joy I can't explain
When from the ground she soaring swings;
She is the creature of my brain!
* * * *
I've never seen an aeroplane!

E. B. L. K.

* * * * *

It is rumoured that, owing to one of the latest all-steel machines having been constructed in close proximity to a large electric generator, it has become magnetised all over, but Mr. Eric Clift assures us that there is no truth in the report that whenever the tail is lifted off the ground it insists on swinging round and pointing to the north, and that several mechanics have been injured by its determined efforts to do its duty as a compass when brought out of its shed to have the engine tested.

* * * * *

In reply to a correspondent who recently wrote to complain that he could not understand the working drawings and sketches published in technical papers, the editor of The Aeroplane wishes to explain that this is not the fault of the papers. He has already arranged that as soon as scientific developments permit, the paper shall be published in three-dimensional form, and its pages will contain solid photographs and sketches. The only thing then remaining will be for the readers to find out how to turn over the pages in the fourth dimension.

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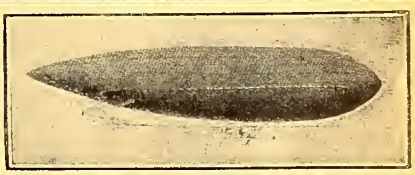


Some Obscure Points in the War Office Competition.

Naturally, now that manufacturers are beginning to design their machines for the War Office competition, a variety of little questions are cropping up as to what the conditions really mean, and what they are intended to mean. For instance, Major E. C. Seaman, R.E., has announced on behalf of the Director of Fortifications and Works that Condition 13 intends that "the pilot must be able to start his engine and get under way without aid of any kind from assistants."

Now, there are two ways even of doing this. One is that he may employ an aeroplane of the ordinary kind and attach it by the tail to a stake or other suitable fixture. He may then start up the engine himself, climb into the machine, run his engine up to full speed to make sure that it is giving its proper power, and then release it from the aforesaid fixture by means of a trip catch, similar to that invented by Mr. Graham Gilmour, and now manufactured by a firm in the Midlands. This catch, or one of a similar nature, is now fitted to all the Bristol monoplanes, and by its aid a pilot would certainly be able to fulfil the condition as laid down.

On the other hand, even with Major Seaman's explanation, the condition might mean that the pilot is supposed to climb into the machine and start the engine up from his seat. The first instance of this practice was undoubtedly Mr. Cody's first aeroplane built for the Army, in which he lifted up the passengers' seats, and started the engine up by pulling the flywheel over just as one starts a gas engine.

To a certain extent the same thing can be done in any machine fitted with dual ignition, in which the pilot can pull the propeller over and fill the cylinders with gas, climb into his seat, and then switch on; but judging from the amount of pulling over most engines take before they do start from the switch, this would certainly be a laborious operation for the pilot, and it would certainly be much preferable if the engines were fitted with proper starting handles at the tail-end of the shaft, which could be pulled over without the pilot quitting the fuselage. This form of starting, it will be remembered, was used in the big Etrich machine which started in the "Circuit of Britain"; only in this case it was the passenger who did the starting-up.

Of course, both these latter methods of starting are open to the objection that unless the engine is fitted with a clutch, so that it can run without turning the propeller, it is impossible to run the engine sufficiently fast to tell whether it is pulling properly, and at the same time to keep the machine from running along the ground; so that practically the self-starting proviso is useless unless the machine is always going to be used on a big ground where it can run about until the pilot finds that the engine is going well enough to make it safe to fly.

Further, even if the engine is fitted with a clutch, unless it is turning the propeller, one really cannot tell whether it is giving its power or not, and the running can only be useful to test the ignition and to warm the engine up. Therefore, it seems that to be any practical use the condition should insist that the pilot or passenger must be able to start the engine without quitting the fuselage, and that it must be possible for the engine to turn the propeller at its full flying speed without the machine running along the ground, which is quite a different condition from anything now existing.

The Meaning of Stability.

Another very ambiguous condition is Clause G of Condition 14. In this it is stated that desirable attributes are "stability and suitability for use in bad weather, and in a wind averaging 25 miles per hour 30 ft. from the ground without undue risk to the pilot." In the first place, one would like to know what the compilers of those conditions understand by stability. One of the most stable machines in this country waves about in the air to an astonishing extent, but always comes back again very quickly, the result being that the writer has heard quite an experienced aviator remark what a very unstable machine it was, his idea of stability being the quality in a machine of departing as little as possible from the horizontal.

As a matter of fact, any naval designer will bear out the statement that quite a number of ships are exceedingly stiff in the water to a certain point, and then roll over and stay there, whereas it may be taken as a fairly general rule that the livelier a ship is the less likely is she to capsize.

In the same way, an aeroplane may be exceedingly lively in the air, and yet practically uncapsizable, whereas a big, heavy, clumsy box-kite may look quite stable, simply because her movements are so slow, and yet when once she gets past a certain angle she will probably be utterly uncontrollable. Therefore, constructors undoubtedly require a definition of stability for competition purposes.

Safety Near the Ground.

In this same clause the phrase "a wind averaging 25 miles per hour 30 ft. from the ground" is distinctly ambiguous, for at first sight it will probably be taken that the wind speed is to be measured at a height of 30 ft. from the ground, but it might equally well mean that the machine is to be made to fly at a height of 30 ft. from the ground in a 25 mile an hour wind, in order to see whether it does so without undue risk to the pilot.

This, of course, would be a most dangerous test, and should certainly be suppressed if it is at present intended to hold it. No pilot in his senses would ever think of flying 30 ft. from the ground in a 25 mile an hour wind. In fact, it would be practically impossible to do so, because over anything like broken country such as, say, the country round Farnborough, or at Brooklands, one never gets a really steady wind at a less altitude than a couple of hundred feet at least, and the gusts set up by a 25 mile an hour wind would easily drop a machine 30 ft. before there was a chance of pulling it up.

It must not be forgotten that a properly designed machine is practically safe in any wind, so long as it is high enough up, just as a life-boat is safe in any sea, but that it is absolutely impossible to make a machine safe in a bad wind when it is close to the ground, just as it is impossible to make a life-boat absolutely safe when within a few yards of a rocky lee shore. The machine or boat may be perfectly stable, but stability will not prevent it from hitting things when the element which carries it falls away in the form of a wave or a gust.

What is Interchangeability?

Another little point on which the writer has heard a good deal of comment is Condition 11, in which it is insisted that all parts must be "strictly interchangeable, like parts with one another, and with spares from stock." Of course, it is ridiculous to suppose, as has been suggested by some would-be humorist, that a machine must be designed so that the right wing can go on the left-hand side, and *vice versa*, or that the elevator flap can be used as a rudder.

It naturally means that all right wings of similar machines must be usable on any other machine of the same type, and that for a given type of machine with a given engine any one propeller must drive any other machine of the same type equally well. This, of course, is rather a severe condition, and one would like to see it modified somehow, because no matter how

The Engine and Chassis of British Army Bréguet.

carefully a propeller may be made, it is practically impossible at this stage of aeroplane development to ensure that two propellers which are absolutely identical, so far as it is possible for the manufacturer to make them so, shall have exactly the same efficiency. The same rule applies more or less to wings, and it is generally necessary even when one has a brand new machine to tune it up for a few days before one gets the best results out of it, so the difficulty would be increased if one new wing were fitted. Even if one has taken the machine to pieces for packing it will very seldom fly as well at the first attempt after it is reassembled as it did before, or as it will after a little tuning.

Consequently, it is to be hoped that the authorities will not insist on absolute interchangeability, and will be satisfied if any wing of a certain type can be fitted to any machine of its own type without any actual mechanical work being done to it, and that such things as elevator planes, wheels, chassis, struts, and so forth, which certainly ought to be absolutely interchangeable, fit into their places without having to be carved about or altered in any way, even though after the new parts have been fitted it may be necessary to adjust wire strainers and so forth.

Of course, so far as propellers are concerned, the right way to set to work undoubtedly is to test a variety of propellers of ostensibly similar dimensions on a machine and select from them, say, three or four propellers which produce the same results on that machine, and one may even safely say that those propellers, at any rate, are interchangeable.

There must be a number of similar points which have occurred to readers of The Aeroplane, and the writer will be pleased to hear of them, so that they may be discussed and brought before the notice of the proper authorities.

Aeroplane Field Organisation in the French Army.

By W. E. de B. WHITTAKER.

There is but little question of the military future of aviation. Apart from any other branch of life which may find the aeroplane useful, its position in armies of the future is assured. The manner in which it will be employed will be decided more definitely by experience than by theory, and its exact importance and place in a field force will also be laid down. But little has yet been done owing to the great amount of time and money expended in experimenting with machines and training officers. Except in the striking force of the Italian Army (and that only due to the Turko-Italian war), aeroplane sections have not so far been officially attached to actual divisions or brigades of any army.

It is interesting, therefore, to examine the aviation section as organised for a field force in the French Army, and tested during manœuvres, at the expiry of which, unfortunately, the section was dissolved, and the component parts redistributed to the aviation camps whence they came. Thus the lessons learnt have not been used to as great an extent as possible. If war broke out, aeroplane sections would have to be reformed, and the various parts would need practice before they could work together for any good. Moreover, generals commanding, not being accustomed to employing aerial scouts, would certainly not be able to make the best possible use of them. Endless practice in times of peace is the best training for war service. Let each man know his place and his duties, and excellent results will be obtained. But leave all organisation and training until the last moment, and chaos will reign.

In France the conflicting views of many who have the best interests of aviation at heart has prevented much of permanent good being done. The French are at the present moment well in advance of the rest of the world in their appreciation of the value of the aeroplane and in the practical proof of their beliefs; but, perhaps, had the money been spent with more discrimination, their aerial corps would by now have assumed a permanent form.

The one great fault of French organisation, civil and military, has been an exaggerated desire for centralisation of control. In the days of *l'ancien régime* local civil administration was almost entirely suppressed, and under Napoleon both civil and military control was finally centralised in the bureaux of the different Ministries of State. And under all the varying Governments and anarchies that have disturbed France from the days of Napoleon until the present this one idea has survived and has dominated French politics, sometimes with good effect but more frequently with inefficiency as its result. Centralisation of control is unrivalled so long as the central authority remains efficient and undisturbed, but let inefficiency enter to ever so slight a degree, and the whole system from top to bottom collapses.

This desire for centralised authority also affects aviation to no inconsiderable extent. The authorities desiring to keep the air section under their immediate control are unwilling to attach that section permanently to different divisions of the French Army. So that, as I have pointed out before, immediately following the manœuvres the various groups of aeroplanes attached to army corps were broken up and returned to the camps where they were previously in training. One can only imagine, in absence of adverse official comment, that the formation used during the manœuvres will in essence be adhered to in future campaigns.

The whole force of aeroplanes used is, with the exception of a few machines retained on staff work and attached to artillery, divided into "field aviation sections," each consisting of three or four aeroplanes. The field section is itself divided into three sub-sections, as follows:—

First Sub-section.—Consisting of the aeroplanes with personnel (each aeroplane having attached to it a pilot, two observers, and six sapper mechanics), aeroplane trucks, and motor wagons. A portable hangar is carried, also tools, such spare parts as are in most immediate request, and petrol and oil for 375 miles. On one of the wagons is a litter and surgical materials. The wagons can travel at an average speed of twenty-five miles an hour. This sub-section keeps with the advance guard of the army.

Second Sub-section.—Two heavy motor wagons, carrying an exhaustive quantity of spare parts, such as extra motors, wings, fuselages. These wagons are both of slow speed.

Third Sub-section.—A portable workshop, mounted on a heavy motor chassis. A forge is fitted, and a complete stock of materials in the rough for the repair of wrecked aeroplanes. On this wagon is an electric lighting outfit for night work, including, as well as smaller lights, three 3,000 candle-power searchlights.

Both these latter sub-sections follow with the ordinary wagon train and join the advanced forces at night.

The aeroplanes attached to the artillery are, for purposes of transportation, mounted on limbers drawn behind vans containing repair outfits, tents, and oils. Each van and aeroplane is drawn by six horses, and therefore travels everywhere with the guns.

Owing to the lack of a standard, or, rather, of a series of standard types for military work, the duties of sub-sections are made much more difficult. They have to arrange for the transportation of such cumbersome machines as the military Farman, as well as the light and compact single-seater Blériot. The difficulties of transport can well be imagined.

Theoretically, the aeroplanes are supposed to travel by air, but weather conditions and slow rate of march of a large army effectually prevent this to any great extent. Further, a prudent general would prefer to keep his aeroplanes for useful work and not risk them unnecessarily in travelling from point to point. As soon as the definite military requirements are known, manufacturers will be able to produce a series of aeroplanes capable of being packed in so small a space that transport by road will be a simple matter.

One fails to see why the second and third sub-section should be separate. They travel together and work together, so that the division seems only to add complication.

These field aviation sections are attached to the army corps as a whole, and are under the immediate orders of the general commanding. It is to be presumed that, as the number of aeroplanes at the disposal of the army increases, sections will be attached to divisions, and even brigades.

Single aeroplanes will probably be allotted to batteries of artillery as well. An aeroplane at the battle of Colenso would have altered entirely the disposition of the British guns, apart from the alteration in Buller's plans, consequent on his increased knowledge of the Boers' position.

Perfection cannot be expected in the beginning of things, but it will come, and its arrival will be greatly accelerated if the lessons of the present are thoroughly appreciated and their teaching applied. Let various systems be tried until the process of alteration and elimination has selected the most suitable form for an aviation corps. But the necessity of the moment in England is aeroplanes, and not theory; men, and not intentions.

The General Staff can store up (not pigeon-hole) the lessons of the present until the acquisition of aeroplanes allows them to be put into practice.

Naval Notes.

Naval Experiments.

In Sheerness Harbour, on January 10th, the first aeroplane flight was made from a British warship, by Lieutenant C. R. Samson, R.N., of his Majesty's ship *Actæon*, one of the three naval officers who have been training at Eastchurch. A dense fog had prevailed during the morning, but at noon it dispersed, and half an hour later Lieutenant Samson left Eastchurch in his Short biplane and flew to Sheerness, passing over the Medway and alighting on the marsh land behind the sea-wall off Cockleshell Hard, on the Isle of Grain. A party of blue-jackets hauled the machine across the sea-wall and beach to No. 126 coaling lighter, and at 1.50 p.m. the biplane was brought alongside the *Africa*. With a derrick the aeroplane was placed on planks, which extended from the fore turrets to the bows, projecting a few feet over the stem of the ship, and at 2.20 p.m., only half an hour after the machine had been brought alongside, Lieutenant Samson gave the signal to "let go." The machine ran down the staging, and after passing the bows rose to about 100 ft., amid the cheers of the officers and men of the *Africa* and the warships in the vicinity. Mr. Samson then flew over the destroyer *Cherwell*, and, making a curve, encircled the battleship at a height several yards below her topmasts. He then rose gradually to 300 feet, and, after passing up the Medway for a short distance, crossed overland again at West Minster and flew back to Eastchurch. The biplane had been fitted with three floats, in case of having to descend on the water during the flight. Vice-Admiral F. T. Hamilton, commanding the Third and Fourth Divisions of the Home Fleet, witnessed the ascent from his flagship.

New Naval Aviators.

Eastchurch had a very busy flying week, although the weather throughout was rather unsettled, and the winds frequently very gusty. A further batch of Naval officers, Lieut. Randel, R.N., Lieut. Seddon, R.N., and Capt. Gordon, R.M.L.I., were appointed for an aviation course at Eastchurch, including technical training in the Short factory as well as tuition in actual flying. With the characteristic promptness of the Service, the two former were soon well on the way for their pilots' certificates, having put in some strenuous work since their arrival. Capt. Gordon, R.M.L.I., is, of course, already well known as a flyer, having taken his pilot's certificate at the Bristol School some time ago.

A Lesson for the Navy.

Lieut. J. W. Seddon, R.N., late of H.M.S. *Canopus* of the Fourth Division of the Home Fleet, was recently appointed to H.M.S. *Actæon*, to which are attached the Naval aviators. Mr. Seddon was out for a training spin on Saturday last, the 13th, and after doing some short straight flights came down too close to the sheds, and was unable to pull up in time, with the result that the machine smashed into the doors of one of the sheds, and Mr. Seddon was caught between the machine and the door, breaking his left leg. Dr. T. Wiglesworth, R.N., was fetched by car, and while awaiting his arrival Mr. Seddon pluckily wrote a letter to allay the anxiety of his people. After he had been attended to by the doctor, he was taken by car to the Naval hospital at Sheerness, where his leg was properly set. He is now reported as making very satisfactory progress. Mr. Seddon will be remembered as the builder of the strange steel-tubular machine which was erected at Wolverhampton, a machine which, though it never flew, and probably never would fly, nevertheless displayed a considerable amount of ingenuity, and it is to be hoped before long that this valuable officer will be able to return to duty.

In connection with this accident it is well to remember that a very similar accident occurred to the late Lieut. Cammell at Hendon, when the machine charged the door of a shed, the machine, pilot, and all going right into the shed, leaving most of its wings stuck on the door frames. Mr. Cammell was unhurt, thanks to the fact that he was sitting behind his engine, whereas in Mr. Seddon's case it was the aviator who took the shock. It is earnestly to be hoped that the Admiralty, having had this one lesson, will, as soon as possible, give up the use of the box-kite type of machine, which, though it may be easier to learn, is undoubtedly dangerous to the pilot even when running on the ground, as has been proved on innumerable occasions.

Of course, such an accident on the more modern type of machine would probably have damaged the engine, and aeroplane engines cost quite a good deal of money, but, although human life even in these days is comparatively cheap, and though ordinary pilots can be hired for rather less than the price of a good chauffeur, nevertheless, in the case of either naval or military officers, quite a large sum has been expended by the nation in their training, and one may, therefore, estimate them as being worth more in hard cash to the nation than even the very best aeroplane engines.

Another Naval Aviator's Accident.

Lieutenant Spencer Grey, of His Majesty's ship *Agamemnon*, who has been flying his Blackburn monoplane so successfully at Weymouth, met with a mishap on the 10th, while flying in the presence of a number of naval officers. Though the conditions were unfavourable he made a successful flight, but it was reported that in landing he was caught by a side gust and turned over. He unfortunately dislocated his arm, and his machine was badly damaged. Several people had narrow escapes. The injured officer is at present in a nursing home, and is expected to be laid up for over a month. This is a singularly regrettable accident, for Mr. Grey is undoubtedly one of our cleverest and most capable naval pilots, and was doing exceedingly good work in demonstrating the capabilities of the aeroplane, as exemplified by the Blackburn, to the large naval population at so important a station as Portland.

Considerable interest has been expressed by various readers in the cause of the accident. It appears that Mr. Grey was on the Tuesday flying over the fleet in spite of a very strong wind. He descended and went up a second time, taking with him as a passenger one of the Blackburn mechanics, who was with him tuning up the machine. On this occasion he took the machine right out over Weymouth. The passenger says that the wind was blowing very gustily, and they were struck by very awkward gusts indeed.

On the Wednesday he went up again, once more in a strong wind. Undoubtedly Mr. Grey is a very fine flyer, but it certainly does not seem worth while taking risks merely when flying for fun at this stage of development. As to the accident itself, this occurred when landing, and simply through trying to avoid the crowd which had intruded on the landing ground, and was not in any way due either to the wind or to the ground itself. People are always a nuisance if they are allowed anywhere on the ground, and many experienced flyers, when they find the crowd encroaching, simply push their machines back to their sheds till the crowd have gone back to their proper places. Mr. Grey is apparently not hurt much, and hopes to be flying again very soon, when it is hoped that he will be rather more cautious as to his selection of ground conditions and weather than he has been in the past, for though he gives promise of being very useful to the Service, it is possible that he is inclined to be a little reckless at times, and he is much too good a man to lose unnecessarily.

A Club with Prospects.

With anything like reasonable luck the Brighton-Shoreham Aero-Club should be a great success as soon as ever aviation begins to attain its proper place in the scheme of things. It is, of course, primarily connected with the excellent Brighton-Shoreham Aerodrome, and has been formed to encourage and assist aviators to develop aviation in the County of Sussex.

The President of the club is Viscount Curzon, and the Vice-Presidents are Lord George Nevill, Sir Theodore Angier, Lieut.-Colonel Gentle, Mr. David Sassoon, and Mr. C. T. Stanford. The Committee consists of Messrs. T. Blair, E. Pope, J. T. Musgrave, and G. A. Wingfield. With such influential backing, and with so far-seeing and businesslike a secretary as Mr. H. Gonne, the club should succeed.

As an inducement to those really interested in aviation to join now, the first 500 members are being elected by the Committee, without entrance fee, at an annual subscription of two guineas, which can never be increased. Members receive, besides their own badges, two ladies' brooches, entitling them to free admission at all times, including a motor-car and chauffeur. Vouchers for friends can be had at reduced rates.

Special inducements are held out to officers of the Navy and Army to make it worth their while to train for their aviators' certificates under the ægis of the club, and certainly no more pleasant place could be found for a period of training than this aerodrome, which is within a few minutes of Brighton by rail or car. Service aviators will find it well worth their while to investigate the terms offered to them.

The instructors in aviation at present are Lieut. J. C. Porte, R.N., and Mr. D. Lawrence Santoni, of the British Deperdussin Syndicate, and Mr. M. Chanter, whose school is already hard at work there.

The Week's Work.

Monday, January 8th.

Brooklands.—S. V. Sippe on Avro-Viale won certificate in brilliant style. Although already through half of tests, he did whole lot from beginning again, and in afternoon flew particularly well, gliding from 500 ft. with engine stopped. Setti out doing straights on Avro-Green, and then on Avro-Viale. Young also out.

Sabelli doing circuits on Deperdussin brevêt machine, and Lieut. Gill, R.A., flying splendidly on racer.

Pizey out with Lieut. Smith at 1,000 ft., ending with S glide. Then with Warren. Garne took second half of brevêt in very good style, and finished course without breakage. Warren then doing straights, also Lieut. Smith. Pizey out with Lane and Nesham. Warren then did two circuits in good style, finishing with excellent glide from 70 ft.

Farnborough.—Military machines out, including new tractor-screw machine piloted by de Havilland. Unfortunate accident to Capt. Burke, as notified last week. Happily that valuable officer now reported to be making excellent progress. Cody out with 120 h.p. Austro-Daimler, showing astonishing speed. Started some way behind new "Factory" machine, and caught it before reaching own shed. Here propeller stream stripped fabric off rudder—now two years old, and soaked with oil—but clever flying saved accident.

The Plain.—Lieut. Borton passed for certificate, flying at 800 ft. and finishing with fine glide, propeller completely stopped. Lieut. Murray and Lieut. Ashton, as well as Lieut. Brodigan, taken for their last passenger flights, and all started on solo stage. Lieut. Freeman took up machine No. 66 to 1,200 ft., and Bendall, who is now quite ready to go for ticket, made neat circuit.

Tuesday, January 9th.

Brooklands.—Lieut. Gill, R.A., again doing excellently on Deperdussin, making two good circuits and then figure eight. Sabelli also circuits.

Vickers school now starting work in earnest. Kemp doing circuits, and then E. V. B. Fisher out for straight flights for first time since accident, and apparently none the worse.

Very nasty accident with Humphreys monoplane. Mechanic Pullen swinging propeller, stepped forward to give an extra turn over when, owing to misunderstanding, pilot in charge switched on and engine started, propeller breaking Pullen's leg in three places, and one arm. Doctor promptly in attendance, and Pullen taken to hospital, where he is reported as doing well. Owing to unfortunate misunderstanding, rumour charges a local motor owner with unwillingness to take injured man to hospital, but there are two sides to every question, and it is well to hear both. Apparently car in question was actually got ready when another was used instead.

Sippe flying excellently, as usual, on Avro-Viale, and Young also out.

Pizey up with Mr. Yates, and, later, with Lane and Nesham, but too windy for pupils.

The Plain (Air Battalion).—Although weather not altogether favourable, flights made by Capt. Fulton, Lieut. Conner, and Lieut. Barrington-Kennett, all on Bristol biplanes, in morning. In afternoon work confined to sheds, and Lieut. Fox joined from Farnborough for further instruction.

The Plain.—Jullerot made trial circuit, followed by Lieut. Bower. Bendall made two short flights, and Fleming one circuit on No. 66, taking Lieut. Murray as passenger.

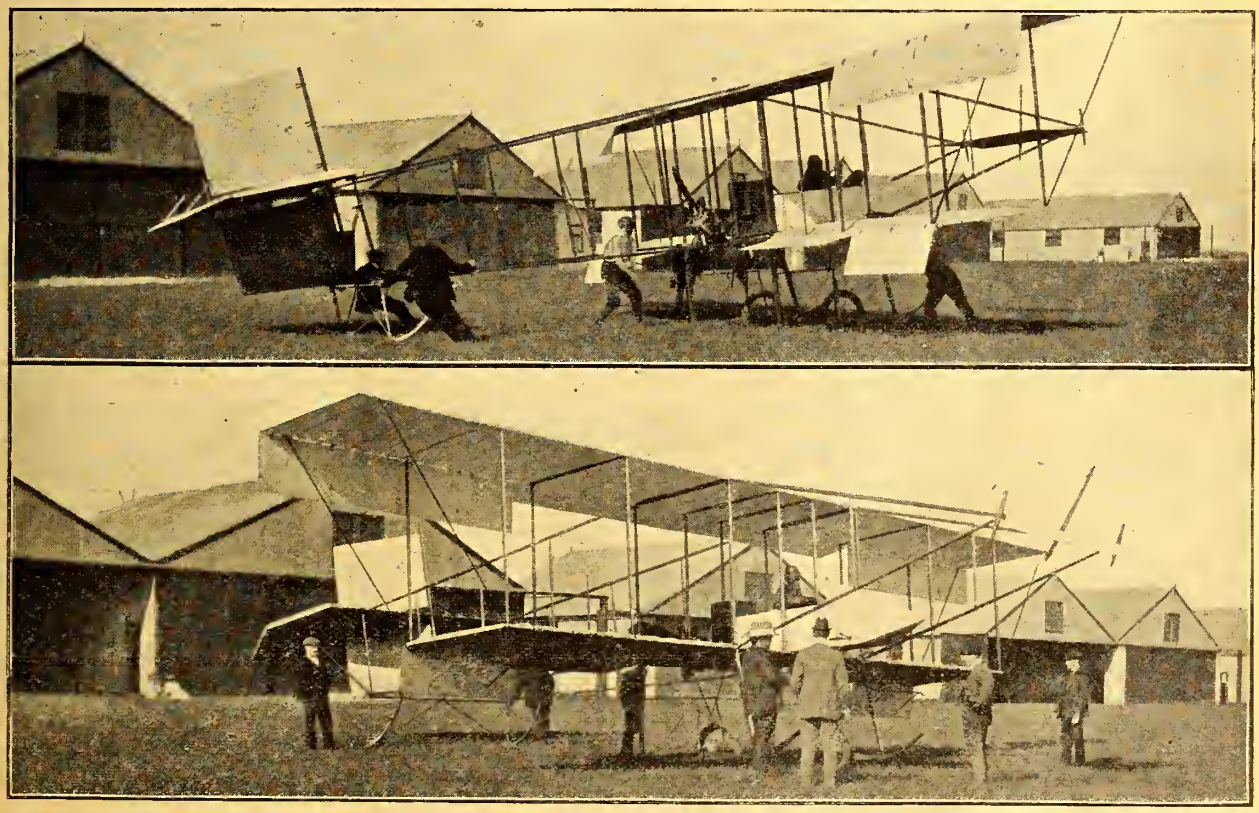
Brighton-Shoreham.—At Chanter School De Villiers and Gassler out in the evening. Chanter testing 40 h.p. Blériot.

Hendon.—Busy day was put in at Grahame-White School; Clement Greswell took out Biplane No. 2 and made circuits before taking up Biard as passenger for instruction. Fowler then took pilot's place and made good straights, after which Raphaite out for rolling practice. New Sommer, built by Heyerman and Warren and fitted with 60 h.p. engine, also out for test by engineers, engine running well and machine looking in fine trim. During afternoon Mr. T. O. M. Sopwith arrived with Martin-Handasyde, brought by road from St. Albans in just over an hour, neat way it was packed for transport exciting great praise. Mr. Lorraine's new 70 h.p. Nieuport also arrived from France.

At W. H. Ewen's School Baumann and Dubois put in good rolling practice, and Warren made two straights.

Wednesday, January 10th.

Brooklands.—Very fine performance by Lieut. Gill, R.A., on Deperdussin in getting his certificate on Deperdussin racer



Lieut. Gregory, R.N.—photographed by Mr. Chattaway—on one of the finely-built Short biplanes used to train naval pupils.

with Y-type Anzani. Did height test of 150 ft. in first circuit of first series of eights. Motor failing towards end of flight and machine held up by sheer skill. Second series ended in same clever style, one cylinder ultimately cracking, owing apparently to defect in oiling apparatus. Later Naval Cadet Robinson, more commonly known as "The Gift," doing straight flights on Deperdussin taxi.

Percival out on *Parseval I.*, experimenting propellers. Lieut. Parke, R.N., on Avro-Viale up at 700 ft., with full load of petrol for 100 miles, out over surrounding country, Sippe also out on same machine, and Young and Setti on Avro-Green.

At Vickers School, Capt. Sykes, of War Office, already skilful pilot of biplane, out rolling preliminary to flying monoplane. Fisher, taking things cautiously at first, doing straight flights.

Pizey out testing in fog. In afternoon Warren doing straights. Nesham rolling, turned too short, and damaged wing tip.

The Plain (Air Battalion).—Thick fog about 8.30 a.m., but Lieut. Barrington-Kennett went out, being lost to view before rising from ground. After few minutes he saw sheds again and descended. In afternoon Lieut. Manisty made good flight, followed by Lieut. Barrington-Kennett on same machine.

Brighton-Shoreham.—Kent, Gassler, De Villiers, and Ross of Chanter School out all day.

England out on Collyer-England biplane.

Farnborough.—Cody out again with twin rudders off smaller machine fitted. Machine flying excellently, but very tricky on fore and aft control, owing to enormous power throwing machine on to its nose.

Hendon.—Foggy all day; pupils busy in Grahame-White workshops.

Eastchurch.—Mr. Frank McClean tried new Short tractor biplane which was just out of the factory. After running engine for short time Mr. McClean took machine up for first flight. So satisfied with behaviour that continued to fly remainder of afternoon. Machine proved very fast, and, in the opinion of aviators watching trials, must have been doing something like 55 to 60 m.p.h. Distinctive feature of test was perfect way in which Mr. McClean made his landings, and very flat gliding angle of machine, which, owing to small head resistance and general design, is very efficient. Machine is fitted with 70 h.p. Gnôme driving a 9 ft. propeller, and has a fuselage and non-lifting tail.

Travers, who misses no opportunity of flying, was out with Territorial pupils, who are making excellent progress. Already Sergeants T. O'B. Hubbard and Hedley, also Cutler and Barton, are capable of taking charge and making short flights on own account.

Capt. Carden, who was piloting "Dunne" biplane, made several short flights, being out to test steering control, which, after slight improvements, is now very effective.

Thursday, January 11th.

Brooklands.—Naval Cadet Robinson doing good straight flights on Deperdussin taxi. Sippe on Avro-Viale flying well. At Vickers School, Kemp, out testing, did three good circuits, after which Fisher did some straights, and followed by doing two full circuits quite in his old neat style.

Cadet Wheeler out for half an hour post-graduate flight; went up to 2,000 ft., landing with beautiful glide. Later Pizey took up Lieut. Gill, R.A., who had just got certificate on Deperdussin. Later still Pizey alone up to 1,500 ft. in one and a-half circuits. Then up with Lane, latter in charge of lever. Warren doing circuits. Then up with Pizey, and, engine going wrong, later Pizey took up mechanic Willis to observe engine, reaching 1,000 ft. in two circuits.

The Plain (Air Battalion).—Splendid day. In morning Lieut. Reynolds out first, followed by Lieut. Conner, who brought out Blériot for rolling practice, and also did one or two hops.

Mr. Cockburn provided sensation of day by bringing out his own constructed miniature Farman and doing a couple of circuits at very great speed. In afternoon Capt. Fulton doing circuits on Mr. Cockburn's miniature Farman, and Lieut. Reynolds and Lieut. Manisty flying at same time.

Then Mr. Cockburn out and did several long trips, while Lieut. Hynes did two long flights of half an hour each on Breguet. Day's work concluded by Lieut. Barrington-Kennett taking Lieut. Beale, R.F.A., for one and a-half hour's trip and finishing with splendid glide.

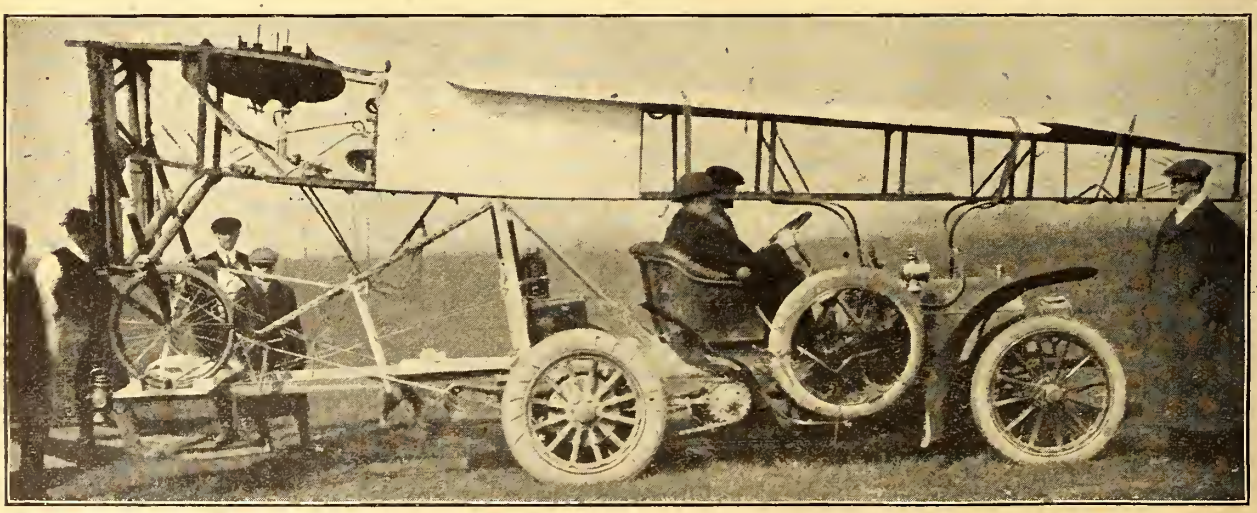
The Plain.—Fleming made trial, then took Lieut. Murray, who afterwards made good solo, as did Lieut. Ashton. These two officers each made two solos, and are progressing very rapidly. Fleming took up Lieut. Brodigan, allowing him complete control of levers. Smith-Barry made impressive flight, followed by Bendall, who did two solos in good style. Jullerot finished day's work by taking Lieut. Marks for two flights.

Hendon.—Morning, wind too high; afternoon, wet and foggy. Allen, Parr, and Desoutter practising glides from about 300 ft. on Blériots, landing in professional style.

At A. S. L. School Mr. Barber took new *Viking I.* off stocks and subjected it to exhaustive tests. After thoroughly proving strength of landing chassis Mr. Barber took machine into air and made many successful flights. Balancers, fully described elsewhere is this issue, proved enormously effective, slightest movement of control wheel rapidly combating any wind-gust. Machine also appeared to have wonderful climbing powers, and got into air with remarkably short run. She is very fast, more than attaining designed speed.

At W. H. Ewen's School, W. T. Warren made several good flights, with excellent landings. In afternoon Baumann and Dubois showed great improvement in rolling. Deperdussin, with new cylinder fitted, was out for test.

Brighton-Shoreham.—Dowland tuning up and testing Collyer-England machine. Ross out on Chanter Blériot.



HOW TO TRANSPORT A BLÉRIOT.—Mr. Morison moving his Blériot from Shoreham in the summer. In front of the car Mr. Gilmour gives advice.

Eastchurch.—Mr. McClean again out on Short tractor biplane, whilst Capt. Gerrard, R.M.L.I., on Short No. 38, and Lieut. Gregory, R.N., on triple-twin, were out from early morning till dusk, training new Naval pupils. In afternoon the aerodrome visited by Admiral Sir Richard Poore, K.C.B., etc., Commander-in-Chief of the Nore, who, accompanied by Capt. Paine, of H.M.S. *Actæon,* arrived in time to see completion of magnificent glide by Lieut. Gregory, who, with engine stopped, planed down and came to a standstill almost at Admiral's feet. Sir Richard keenly interested in all going on, and, after witnessing excellent exhibitions of monoplane flying by Lieuts. Samson and Longmore on the Blériot-type Birdling, expressed desire to fly, and was taken up by Capt. Gerrard, R.M.L.I., on Short No. 38 for twenty minutes, experience with which he was highly pleased. Another distinguished visitor during day was Capt. Seymour Erskine, A.D.C., Commodore, R.N. Barracks, Chatham, who was also piloted by Capt. Gerrard.

Friday, January 12th.

Brooklands.—Capt. Sykes doing rolling practice on Vickers. Percival out on *Parseval I.,* flying much better with fuselage 4 ins. farther forward in planes. This machine, built so that by taking out four bolts whole fuselage can be shifted fore and aft, and perfect balance obtained.

Cadet Robinson on Deperdussin taxi doing straights, finishing by flying full length of ground in very nice style. Lieut. Parke, R.N., on Avro-Viale, with full load of petrol, went up to 500 ft. in five minutes, and stayed there for half an hour. Sippe on same machine, and Young and Setti on Avro-Green, also out.

Pizey up with Lane, latter taking lever, then with Nesham, Warren doing circuits and right-hand curves at 100 ft., gliding from 70 ft. Pizey up with Nesham at 1,500 ft.

The Plain.—Fleming made trial, afterwards taking Lieuts. Brodigan, Ashton, and Murray. Then tested Army biplane for Lieut. Fox. Bendall made several circuits, followed by Lieuts. Ashton and Murray. In afternoon, Fleming took Lieut. Brodigan. Lieuts. Murray and Ashton made several flights, and Bendall made solo circuit. Prier made fine flight on military monoplane.

The Plain (Air Battalion).—In morning Capt. Fulton and Lieut. Reynolds gave exhibition of scouting and observation flights. Lieut. Fox doing big circles at about 100 ft. At 12.30 Lieut. Hynes, with Lieut. Barrington-Kennett, set off for long cross-country flight, but owing to mist and engine trouble were forced to descend at Easterton. In afternoon Capt. Fulton took two Army officers for fifteen-minute flights, whilst Lieut. Fox did good flying low down.

After this, Mr. Fox, who has not got his certificate yet, and has only had about six hours' instruction, went up and flew for half on hour at an average of 500 ft., doing perfectly banked right and left hand turns, and did a forced glide from that height (owing to petrol connection breaking), making perfect landing.

Lieut. Porte, R.N., testing Deperdussin prior to handing over, did beautiful flight at about 1,000 ft. Lieut. Hynes on Breguet, accompanied by Lieut. Barrington-Kennett, arrived from compulsory resting place at 4.30 p.m., thus ending day's entertainment.

Brighton-Shoreham.—Gassler out in the morning on Chanter Blériot and flew into railings between restaurant and sheds; machine came off worse than railings. Pilot unhurt.

Farnborough.—Cody out with two passengers, Capt. Trotter, 12 st., and Frank Cody, 9 st. Live load, 36 st. Machine lifting with greatest ease, quite able to carry five for whom seating accommodation arranged. Trio out round country generally.

Hendon.—Weather dull, but no wind. Grahame-White School busy all day, one school machine putting in no less than five hours' constant work. Commenced by Fowler taking out Biplane No. 3 and doing steady straight flights at about 50 ft. Biard was also out rolling and doing short hops on " beginner's " Farman. Raphaite and Major Liles also out most of morning, latter controlling the machine in fine style. In afternoon, Fowler, Biard, and Major Liles all making straights, whilst Raphaite and Lieut. Stopford, R.A., put in a great deal of rolling practice. A notable pupil put in an appearance during afternoon, to wit, Mr. T. O. M. Sopwith, who, for edification of himself and pupils, piloted old school 'bus several times round aerodrome, after which new school biplane, which was waiting for test, was brought out and flown by him, Mr. Sopwith later testing her weight-carrying capabilities by taking Mr. R. Gates up with him. Pothet, Welburn, and Clappen doing good straight lines, and hope to equal other Blériot pupils.

At A. S. L. School Mr. Barber again out on *Viking I.* for half an hour. In afternoon quite calm, but rather foggy, and numerous machines were out, so to keep in still air Mr. Barber took *Viking I.* up several hundred feet and flew circuits in magnificent style. Flying whole afternoon, landings being wonderfully good, and demonstrating beautiful gliding angle of new machine. Ridley-Prentice was also flying Valkyrie monoplane during afternoon, but thick fog prohibited a greater altitude than 300 ft. Flights included numerous glides to keep in sight of land.

At W. H Ewen's School Baumann and Dubois improving in straights, and Warren made two short flights. Ewen had the 28 h.p. Deperdussin out and put in very fine flight for twenty minutes at 400 ft., notwithstanding the fog, finishing with magnificent glide in front of hangars.

Eastchurch.—Most of aviators out practising, including Lieut. Dunne, who made an excellent flight on Dunne monoplane. Mr. Alec Ogilvie also out on N.E.C.-Wright biplane, now in excellent condition, doing by actual test over 45 m.p.h. and climbing, when required, at remarkably steep angle. N.E.C. engine used by Ogilvie evidently in excellent running order, and, judging by reduced noise, has been fitted with an effective silencer.

Saturday, January 13th.

Brooklands.—At Vickers School, Kemp doing circuits, testing. Then Fisher for two circuits in very good style. Later Lieut. Beattie, R.E., one of many fine flyers of Avro and now about to become monoplanist, out rolling, this being first time on machine for many months. Should become one of our most useful Army aviators.

Maurice Ducrocq, just recovered from influenza and out for first time to blow microbes away, flying in usual fine style and looked much better after it.

Percival doing quite wonderful things on *Parseval I.,* now flying really well, in spite of propeller being too big for engine and only turning at 900 r.p.m. instead of 1,150. Right hand turns excellent, and gliding angle apparently very good; machine seems particularly easy to land, and " pancakes " last few feet as well as a box-kite biplane.

Spencer out testing, but apparently Gnôme not pulling very well; his cornering, as usual, very good. Young out in morning on Avro-Green. Lieut. Parke, R.N., started at 12.40 p.m. on Avro-Viale, going for cross-country test for superior brevêt. Oxford given as turning point by Mr. G. F. Joseph, assistant-secretary of Royal Aero Club. Parke started well, but nothing further heard of him, and considerable anxiety felt when it became known that he had not arrived at Oxford. No news of him up to end of day.

At Deperdussin School, Cadet Robinson doing straights on taxi all morning. In evening Sabelli on racer, testing engine with new cylinder, flew several circuits, and, though rather wavy longitudinally, took his corners very sharply and neatly. Machine exceedingly fast, probably 65 m.p.h., and very quick on controls, yet apparently stable.

Pizey up with Lieut. Smith, then with Lane. Warren doing circuits. Then Lieut. Smith doing straights alone. Lane also did first straight. Later, Pizey up with Mr. George Lloyd, M.P., as passenger. Mr. Lloyd may be our first flying Member of Parliament.

Brighton-Shoreham.—Chanter out flying 40 h.p. Anzani-Blériot across country. During second flight landed in field owing to down draught and smashed machine.

Hendon.—At Grahame-White School, Fowler, Raphaite, and Lieut. Stopford all out on Biplane No. 3, former making splendid straight flights with excellent landings; should in another week be ready to take brevêt. In afternoon Lieut. Stopford out on No. 3 followed by Raphaite, Fowler, and Major Liles, last making steady straights. Fowler and Gates also out on Biplane No. 2, which, with its 50 h.p. Gnôme, is about ten miles an hour faster than No. 3, consequently wants watching more closely. During afternoon Handasyde had Martin-Handasyde out, and put engine through test, getting 1,380 r.p.m. M. Salmet, Blériot School instructor, putting up excellent figures of eight to show pupils ease with which right and left turn can be made on Blériots. As further demonstration he made two figures of eight in quite small space, only 15 to 18 ft. from ground, on 50 h.p. machine.

Mr. Barber made trial flight on A. S. L. School Valkyrie, flying several circuits, terminating with faultless glide in front of hangars. Lieut. Hawker on same machine put in hour's good practice before dark, making excellent straight flights over length of aerodrome.

At W. H. Ewen's School, Baumann and Dubois made excellent straight rolls, with tail well up. Lawford, new pupil, made fine straight at his first attempt.

Filey.—Weather has been bad for flying, but some short practice flights have been put in by Brereton and Hunt on Blackburn-Isaacson. Mr. Laurence has arrived at Filey, where he will remain some days, and hopes to put in practice preparatory to taking machine to Shoreham, where he intends to fly for a few weeks.

Eastchurch.—All aviators out, including Jezzi, who, piloting his high-speed biplane, made several excellent flights. Mr. V. A. Barrington-Kennett, of Territorials, and Mr. S. P. Cockerell down on Saturday for week-end, and got some fine practice on school machine. Mr. Barrington-Kennett made *the* "Territorial" flight of the week, remaining in air for nearly three-quarters of an hour, doing some sharp banking and figures of eight, which would easily have won pilot's certificate, and, considering that he has only had charge of machine on two occasions, he has made wonderful progress.

Just at dusk Valentine, who had been flying over Sheerness, appeared on Deperdussin, and, after making circles, alighted. After filling up with petrol he went off, intending to get to Brooklands, in which direction he disappeared at great altitude, but came back fifteen minutes later, realising that he could not get there before dark.

Event of week undoubtedly Lieut. Samson's flight from battleship *Africa*. Start being visible from shore at Sheerness, this has naturally been given publicity by the Press, but actual photos and details have not been obtained, which is quite as well, the experiment being for Navy purposes only.

Sunday, January 14th.

Brooklands.—Pizey out testing, with Lieut. Smith as passenger. Later with Mr. Ebben, from South Africa, and afterwards with Mr. Smith, finding cross wind at 500 ft. Percival flying with his sister as passenger on *Parseval I.* Spencer also out. Kemp doing circuits on Vickers.

Lieut. Parke, R.N., returned in evening from Oxford—by train—and reported having run out of oil at Abingdon, only seven miles from Oxford, on Saturday. Had a very good journey, but at 1,000 ft. found he could not see ground, so flew most of way at 700 ft. Made rather rough landing at Abingdon, and broke some wires in chassis. When repaired, engine refused to start, so with help of mechanics from neighbouring garage, took off outer sections of planes in less than an hour and stowed whole machine in garage—to be left till called for. Leave expired on Monday, so no chance of flying back and making another attempt. Should, however, do so at next opportunity.

The Plain (Air Battalion).—Lieut. Barrington-Kennett up on Bristol biplane in very gusty wind. Three flights of ten minutes each.

Hendon.—At W. H. Ewen's School Baumann persevering with straight rolls, and Lawford showing much improvement and aptitude. Dubois, leaving the rolling stage, made splendid straight flight. Warren made two good flights in a 10-14 mile wind.

The Royal Aero Club.

At the meeting of the Committee on the 9th inst., the following new members were elected:—

Frank S. Barnwell, G. F. Campbell-Wood, Captain Robert Gordon, R.M., Captain R. M. Harbord, R.N., William Ewart Hart, E. B. Hedley, Dr. Ian Howden, J.P., Herbert Fetherston Lloyd, Captain George Hebden Raleigh, and Eng.-Lieutenant C. R. J. Randall, R.N.

The following Aviators' Certificates were granted:—169. Lieut. Garthshore Tindal Porter, R.A. (Bristol, Salisbury). 170. Lieut. Amyas Eden Borton (Bristol, Salisbury). 171. Benjamin Graham Wood (Hewlett and Blondeau Farman, Brooklands). 172. Sydney Vincent Sippe (Avro biplane, Brooklands).

The Special Certificate was granted to (4) Geoffrey de Havilland (Factory biplane, Farnborough). Course: Farnborough to Shrewton and back.

The following resolution was unanimously passed:—

"That aeroplane flights over the River Thames or its banks during regattas, or on occasions when large numbers of persons assemble on the river or its banks, be prohibited, as being undesirable and fraught with danger to the public safety, and that any breach of this regulation be punished by suspension of certificate, and/or removal from the Competitors' Register, or otherwise, as the Committee thinks proper."

A letter has been received from the Home Office intimating that the Secretary of State does not, in view of the above resolution, think it necessary at present to make an order under the Aerial Navigation Act, 1911.

Mr. Tom Garne, who has just got his certificate, and Mr. Gordon Bell, who is flying so well in France, here seen with the Deperdussin they used to fly at Brooklands.

Alexander Prize Competition for Aerial Motors.—The report of the advisory committee for Aeronautics on the tests will shortly be made to a joint committee of the Aeronautical Society, Royal Aero Club, and Aerial League, who will make the award in conjunction with Mr. Patrick Y. Alexander.

Royal Aero Club Challenge Cup, 1912.—Mr. John Dunville has kindly presented another One Hundred Guinea Challenge Cup for the longest voyage in any balloon, airship, or aeroplane during the year 1912.

A British Pilot in France.

Mr. Gordon Bell, now flying for the R.E.P. firm, writes:—"Many thanks for the *journal anglais* which I read with huge joy. They seem quite surprised here to find that an Englishman can fly. I have got one of the Circuit Type machines to go where I like on, and have been doing long flights round the surrounding country. She is awfully stable. I've had her out in a 12-metre per second wind, which I believe is somewhere in the neighbourhood of 25 m.p.h. I also tried landing in a ploughed field with great success. There is an English pupil here, a Mr. R. Scholefield, seventeen years old, getting on well. Cheer, oh! Good luck to the paper."

A French paper, reporting the work of the flying school at Buc, says: "Splendid flight of Gordon Bell, who in a few minutes elevates himself to 900 metres (about 3,000 feet), holds the air near to an hour, and redescends with a masterliness incomparable." In a previous note the same artist says:—"Gordon Bell, for his first flight alone, emarvels his colleagues by his surety of hand and his audacity." The Aeroplane regrets that its school reports cannot touch the graphic style of the French journalist.

An All-Steel Blackburn.

Mr. Lawrence, who took his certificate on a Bristol biplane, and has since then done some very good flying indeed at Brooklands, has just ordered a Blackburn monoplane of the latest type. This machine is built entirely of steel, and is, in the opinion of its designer, Mr. Blackburn, a much more mechanical job than wooden machines, and much superior to them in every way. Mr. Blackburn says that he will, of course, still continue to build wooden machines, but, personally, he prefers the all-steel type. Mr Lawrence, who, it will be remembered, is a Territorial, is taking the machine out to India.

Design for Transatlantic Machines.

The question of flying the Atlantic Ocean is very much to the fore at the moment, and although two pilots have expressed their intention of making the attempt, no one has as yet published (in this country, at any rate) an account of the considerations necessary in a non-stop flight of such extreme length.

The first question is the necessary length of flight. This works out at almost exactly 1,800 miles, making the flight from the eastern corner of Newfoundland to the West Coast of Ireland. Also, there is the live load to be considered. Now it is obvious that one pilot could not be alone in the machine during the time necessary, so that the machine must be capable of carrying two persons, besides an allowance of food, etc. A fair weight for this is about 400 lbs.

So far all is plain sailing, but now difficulties begin to arise. The prime and governing factor is the fuel which must be carried. The calculation of this would appear on the face of it to be perfectly simple, but, as a matter of fact, I worked hard for four days upon it, and it was then only by a stroke of luck that I hit on an expression which gave me the key of the matter. The point is this: As the fuel is consumed the weight carried is diminished, and consequently the engine can be slightly throttled down. This means that the rate of consumption of fuel will fall in its turn. From these facts it is obvious that the calculation of total amount of fuel necessary in terms of the constant useful load is not so simple as it appears. However, it can be done. I do not propose to go into figures here, but I will outline the method employed, in order to show that the conclusions are logical.

First, the rate of fuel consumption depends directly upon the horse-power exerted (in fact, fuel consumption is usually estimated at so many pounds per horse-power-hour). Now the load to be lifted may be divided into two parts: first the machine, engine, and live load, which are constant, and, secondly, the fuel, which is always diminishing. We may say, therefore, that the rate of consumption of fuel is equal to the sum of these two loads, multiplied by the speed, by the fuel per horse-power-hour, and by a constant depending on the gliding angle of the machine.

In order to find the total fuel consumed during the flight it is necessary to integrate the above expression, and it is here that the difficulty arises. When, however, it is done, we arrive at some interesting facts. First, the weight of the fuel is directly proportional to the weight of the constant load. Secondly, although the rate of consumption depends directly upon the speed, the total consumption is independent of the velocity, but depends, in a rather peculiar way, upon the length of the flight. It also depends in the same way upon the gliding angle and on fuel per horse-power-hour.

For those who, having a practical acquaintance with logarithms, care to work out the calculations themselves, I give the expression. It is as follows:—

$$f = w\left(e^{\frac{a\,b\,l}{375}} - 1\right)$$

where f = weight of fuel, w = weight of machine, engine, and pilots, etc., e = 2.7183, a = gliding angle, b = lbs. of fuel per h.p.-hour, and l = length of flight. It will be observed that the *total* weight, which = $f+w$, follows the exponential or "compound interest" law, only reversed. Just as money lying at compound interest increases at an increasing rate, so, during the flight, the fuel diminishes at a diminishing rate.

It is necessary, in discussing the possibility of the flight, to assign values to these various factors. In doing this I have taken in each case the best factor which I can find in use at the present day, as giving an indication of what can be done by combining the best points of various engines and machines in existence. I have taken a gliding angle of 1 in 5.3, which has been exceeded in practice by Nieuport, Flanders, and Cody. This means that at 60 m.p.h. the engine must lift 33 lbs. per h.p.—a figure attained by the "harem-skirted" Antoinette recently built.

The fuel consumption I have taken at .6 lbs. per h.p.-hour, including oil. This works out at 5.8 gals. per hour for a 68 h.p. engine.

Using the above very practical values, we find that the weight of fuel necessary is of the order of .42, or nearly half, of the total weight.

I next assume that the engine weighs 4 lbs. per h.p., which is a figure well within the reach of current practice. Since the total weight is 33 lbs. per h.p., the engine will weigh just under one-eighth of the total weight of the machine. This total weight is composed of four items: the fuel, which, as indicated above, works out at .42 of the total; the engine, which is about .12 of the total under the conditions above-mentioned; the pilots, etc., which amount to 400 lbs.; and the machine itself. On the latter item I have been unable to obtain sufficient detailed information to give an exact average value; but a very fair assumption is that the weight of the machine itself is of the order of one-third of the total weight. This is a good average estimate for machines of normal size, and it must be remembered that in every known case of machine construction it is always possible to build a large machine lighter, proportionally, than a small one. But in this case it must be noted that some weight must be added in the form of an enclosed body for the pilots, and a full set of reliable instruments of navigation.

On looking at the four items we find that three of them are proportional to the total weight, while the fourth is constant. The first three, when added together, amount to .873 of the total, so that the remaining .127 is the sole margin remaining for the weight of pilots, food, etc. As we have seen, the latter is about 400 lbs., so that the total weight will be 3,160 lbs., which will be accounted for as follows:—

Two pilots, etc.	400 lbs.
Machine	1,053 ,,
Engine	380 ,,
Petrol and oil	1,327 ,,
	3,160 lbs.

It will be seen that the engine weighs 380 lbs., which means, according to our former reckoning, 95 h.p. This seems, and is, a rather small horse-power for the size of the machine, but the reply is simple: If the machine is not efficient enough to fly with this power, it is not efficient enough to perform the flight. It would be advisable to fit an engine of rather larger h.p., to give a reserve of power for emergencies. But it must not be used unless absolutely necessary, for its use for more than a few minutes will probably mean that the fuel will be exhausted before land is sighted.

A most important point, the truth of which I have assumed, is that on throttling down the engine the fuel consumption will diminish in exact proportion to the power. This is undoubtedly true within limits, and will, I think, be substantially true for the flight under consideration. The power at the commencement is 95 h.p., and the weight 3,160 lbs. At the finish of the flight the weight will have dropped to 1,833 lbs., and the power to 55 h.p.

The fuel, which amounts to 190 gallons, will occupy a space of about 30 cubic feet, which means a rectangular tank of 2 ft. by 3 ft. by 5 ft. This is not at all unwieldy considering the large machine on which it will be placed.

The machine, which will be obviously of the biplane type, will need a surface of about 960 sq. ft., which means a span of, say, 60 ft. and a chord of 8 ft.

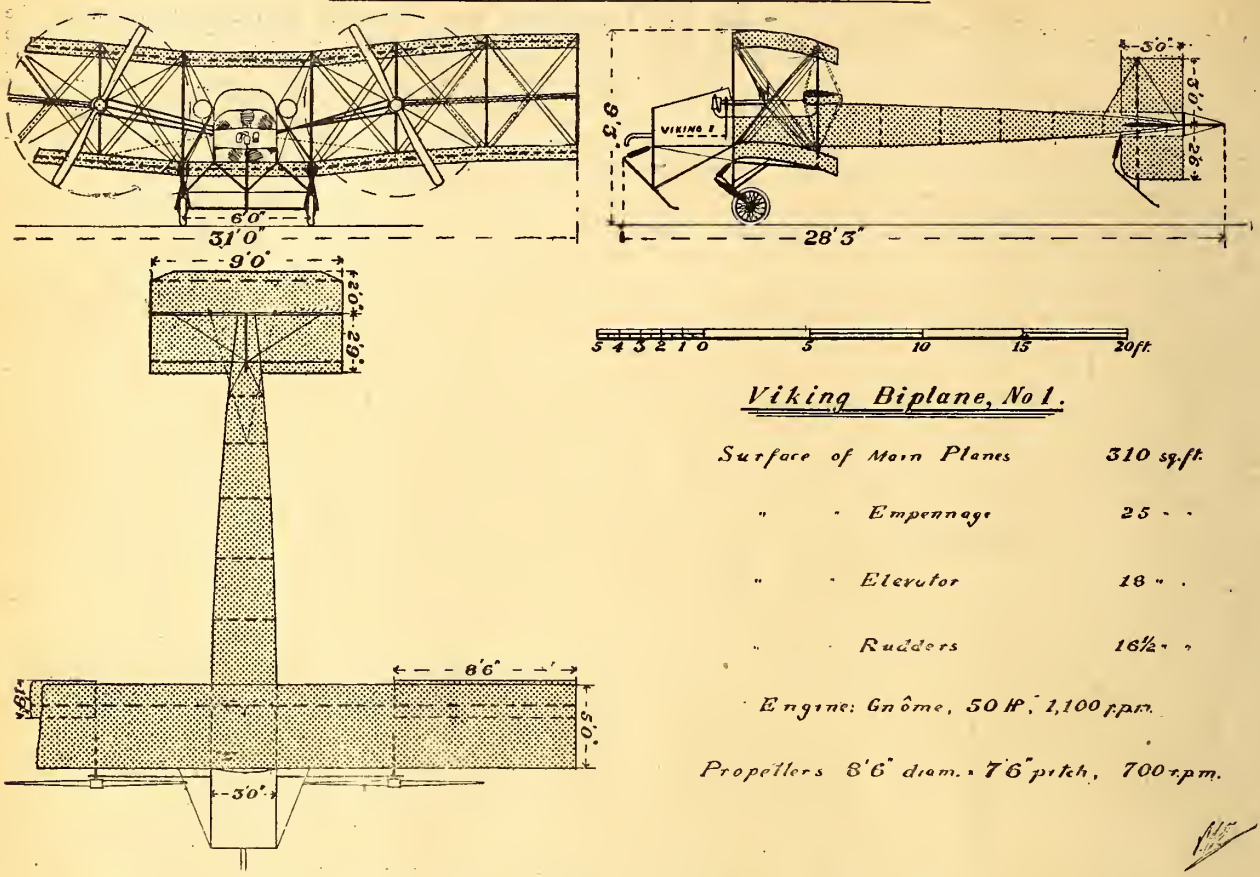
The fuselage must be large enough to afford a small enclosed "cabin" for the pilots. I say a cabin, for mere enclosed seats are not enough. It is of immense importance that the pilots should be fit and comfortable during the flight, and for this purpose it is necessary that one of them at a time should be able to stand up and stretch his limbs, sit down, and eat in comfort, and, if necessary, lie down and rest. If the entire gap between the planes is filled with the fuselage (which makes an excellent design) there will be room for petrol tanks and for the cabin, all in the immediate neighbourhood of the centre of gravity. This is very important in this particular case, as the amount of fuel is very large and the pilots will wish to move about. To build a machine of this size for a weight of 1,053 lbs. is no easy matter, but I think it can be done.

Throughout the calculations the outstanding point is that for any loss of efficiency or quality on any of the parts considered the total weight and size of the necessary machine will be considerably increased; in fact, if the efficiency is not very good the flight becomes impossible.

It is this that accounts for the fact that Mr. Martin, in designing his machine, has had to allow for 2,000 sq. ft. and 250 h.p., for the engines he proposes to use are known to be distinctly inefficient as compared with the best types.

F. K. Turner.

"VIKING I."



Viking Biplane, No 1.

Surface of Main Planes	*310 sq.ft.*
" " *Empennage*	*25* " "
" " *Elevator*	*18* " "
" " *Rudders*	*16½* " "

Engine: Gnôme, 50 H.P. 1,100 r.p.m.

Propellers 8'6" diam. × 7'6" pitch, 700 r.p.m.

The latest product of the Aeronautical Syndicate, Limited, at Hendon, is certainly a credit to the firm, and worthy to issue from the same workshops as the Valkyries, for whatever opinions people may hold as to the theories governing the aerodynamic design of the Valkyries, there is no disputing the fact that so far as pure mechanical design and workmanship is concerned there is not a better machine in the world, and that, in the hands of pilots who learn to fly them properly, and do not try to treat them in the same way as machines of entirely different types, they are as safe as any other machine, and very much faster than most.

Mr. H. Barber, the designer of both machines, has decided that the name Valkyrie shall be confined to the Valkyrie type of machine, whereas the new machines will be known as Vikings, a good name for machines which, with any luck, should assist very materially in the conquest of the air, just as their namesakes had a big share in ruling the sea.

Imprimis, the machine is a biplane, of the modern type, with the engine in front, a long fuselage, and a non-lifting tail with an elevator flap behind it. But in almost every other way there is originality writ large all over it. The chief distinctive point is that there are two tractor screws running in reverse directions, one of them being driven by a crossed chain. These screws are of 8 ft. 6 ins. in diameter, with a pitch of 7 ft. 6 ins., and run at 700 r.p.m., with the engine, a 50 h.p. Gnôme, running at 1,100 r.p.m.

The engine is carried rather far out in front of the planes, under a handsome streamline cowl, which runs back to a regular dashboard, in which are fitted the revolution indicator, a barometer, a clock, petrol and oil gauges, and the sight-feed lubricators for the engine. The reason for placing the engine so far forward is to arrange the balance so that the pilot and passenger, who sit side by side in a couple of comfortable bucket seats, may be placed far enough back to avoid having their legs under the dashboard, where, in Mr. Barber's opinion, there is a danger of their breaking their legs if pitched forward by a rough landing. This is a point well worth considering, even at the expense of increasing to some extent the longitudinal moment of inertia.

The fuselage, which is deep and wide at the seats, tapers well towards the tail, and is cased in fabric all the way along.

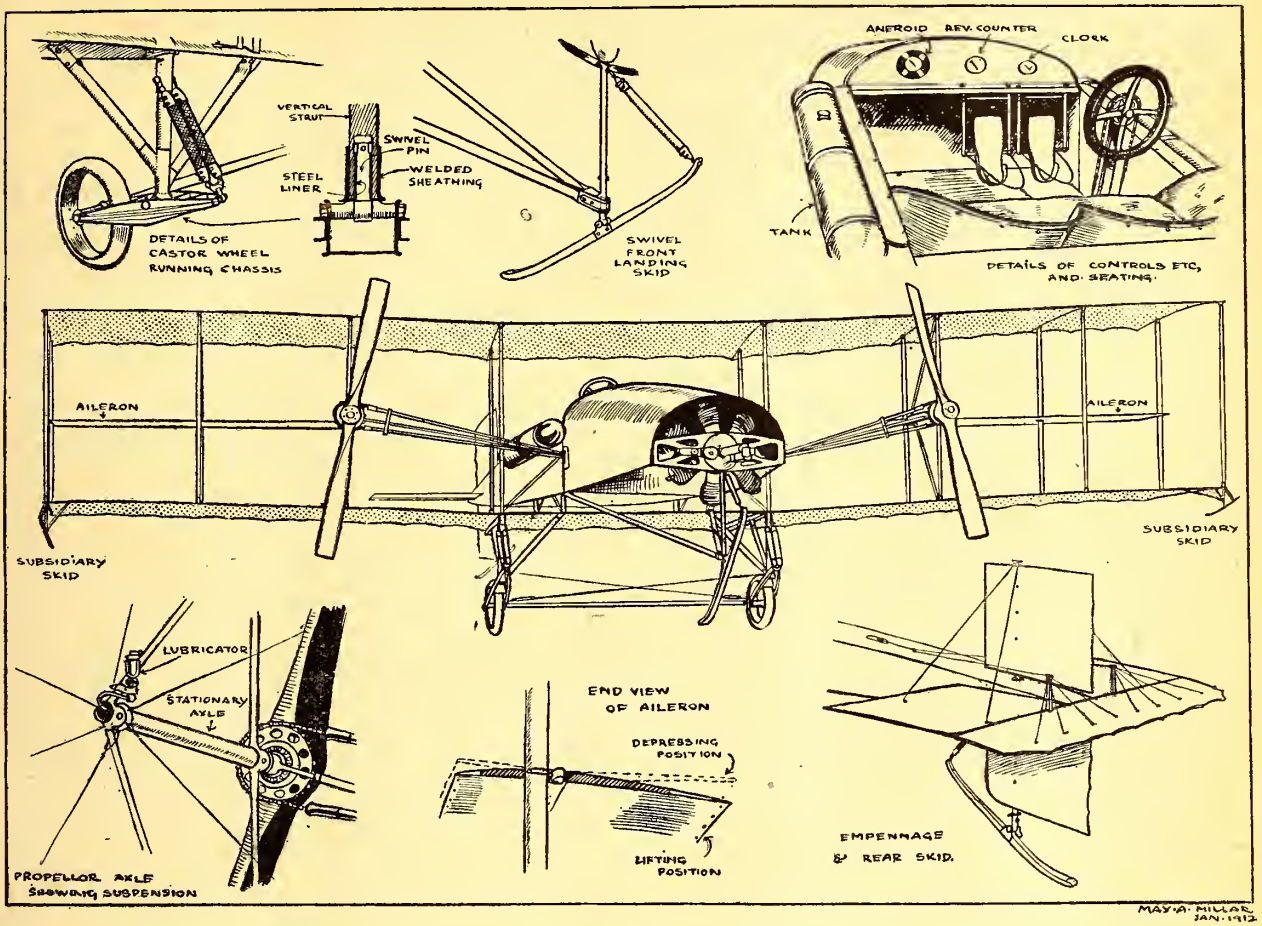
The rudder, which has plenty of surface, is balanced—that is to say, a proper proportion of the surface is in front of the rudder-post, this being fixed level with the front of the fixed tail-plane, so that the rudder is not cut away to make room for the elevator. The major portion of the rudder is above the tail-plane, but there is also a good big rudder-surface below it, the post acting as the pivot for a universally jointed skid.

The main-planes are built to the design of those used on the Valkyries, with the main spar forming the leading edge, and are single-surfaced, or perhaps I should say the upper and lower surfaces are stitched together, leaving pockets for the ribs. There are four pairs of uprights on each side of the fuselage. The first pair fit on top of the chassis struts, and the front one of the second pair is of steel tube, and carries the tubular steel axle on which the hub of the propeller on that side runs. From the inner pair to the second pair the planes have a pronounced dihedral angle, but to the third and fourth pair the upward tilt of the wings is much less.

Lateral stability is secured by true *ailerons*, proper "little wings," fixed to the three outer rear uprights on each side and pivoting on them. These ailerons are unusually interesting, as they are the first attempt to solve a really great problem in aerodynamics, namely, the use of a controlling surface having both variable incidence and camber.

In their normal positions they are merely horizontal planes of streamline section, upper and lower surfaces being alike. When the warp is put on, the rear edge of the one intended to lift drops considerably, while the entering edge drops a little, so giving the aileron the section of a properly cambered lifting plane. At the same time both edges of the opposite aileron rise, giving it the same camber, but upside down. In order to preserve accurately the streamline form of the surfaces they are made of sheet aluminium with spring-steel ribs inside, and an ingenious sliding arrangement allows for the alteration of distance from front to rear edge, according to whether the surface is concave or convex.

Of course, such an arrangement must be much more effective and must balance much better than any flap or warp, but



Mr. Barber points out that these are purely an expcriment and we must not expect too much of them. I rather fancy that, situated as they are between the planes and behind them, they will suffer from interfering currents from the upper surface of the lower plane and the lower surface of the upper plane, though, as the chord of the main planes is only 5 ft. and the gap between them is 5 ft. 6 ins., the losses will be less than they would be in most biplanes.

The chassis of the machine is also very interesting. It consists of two wheels, coupled at the hubs by a tracking-bar, and each mounted in a very neatly designed fork built up of sheeet-steel. This fork is the rear end of a cantilever, which is held in the middle by a universal joint which allows each end to rock up and down, and allows the whole fork to orientate—or swivel, so that the wheels track like castors. The front, or opposite end, of the cantilever is held up by stout rubber springs. The universal joint itself is at the apex of two struts forming a V, and stayed up by wires; the two V's—one for each wheel—forming the whole of the chassis members. Under the engine is a similar V, carrying on its apex a rubber sprung, steel-shod skid, which is mounted in a universal joint, so that it swivels just as the wheels do, and a smaller skid on the same principle is fitted to each wing tip. The total head resistance of this landing gear is surprisingly small.

The control is by a warping-wheel on the top of the elevator lever, the rudder being worked by the feet through very neatly designed pedals, which form a kind of stirrup for each foot.

Altogether, the whole machine is exceptionally neat and workmanlike, and if it flies anything like as well as it looks it ought to be a surprise to some of the critics of British constructors.

Mr. Barber's departure from the Valkyrie type, with which he has identified himself so far, and his production of a machine which is on popular lines and yet manages to be original, cannot fail to do him and the A. S. L. credit, for it proves versatility, and removes any impression of prejudice in favour of one type, which his previous productions may have given. Nevertheless, he has by no means forsaken the Valkyrie type, for he showed me a very smart new Valkyrie racer just coming through, in which he is warping the wings instead of using stabilising flaps, and is diminishing the dihedral of the wings very considerably. It is, also, somewhat lighter than previous Valkyries.

However, *Viking I.* is the centre of interest at present, and her initial flights will be watched with the very greatest interest. Being the first of her type she may need a good deal of adjusting before she flies perfectly, but one may be pretty sure of her ultimate success. C. G. G.

The Aeronautical Society's Next Meeting.

It is announced by the Aeronautical Society of Great Britain that at 8.30 p.m. on the evening of Monday, January 22nd, Dr. E. H. Hankin, M.A., D.Sc., will lecture on "The Development of Animal Flight." The lecture will take place at the Royal United Service Institution, and Sir George Darwin, K.C.B., F.R.S., will take the chair. Tickets may be obtained on application to the Secretary, The Aeronautical Society of Great Britain, 53, Victoria Street, W.C.

Miss Gertrude Bacon at Bristol.

At the headquarters of the Bristol and West of England Aero Club (Clifton Down Hotel), last week, Miss Gertrude Bacon, whose name is closely associated with aeronautics, gave a most interesting lecture, and the pity is that more members of the club did not avail themselves of the opportunity of hearing her.

Mr. A. Alan Jenkins (hon. secretary) presided.

Miss Bacon said it took man a very long time to realise that he would never be able to fly like a bird, because he was physically constituted very differently to a bird. The great invention came as all great inventions did come, and Miss Bacon told the story of the construction of the first hot-air balloon. The lecturer detailed some of the most interesting incidents connected with her own experiences as a balloonist. Miss Bacon also discussed the airship and the aeroplane. Miss Bacon was the first woman in the world to make an airship voyage, and was the first Englishwoman to fly, and she has flown on both biplane and monoplane.

THE CODY BIPLANE.

Since the unfortunate accident to Mr. Cody's "Circuit of Britain" machine he has reassembled the old machine he flew during 1910 both at Doncaster and elsewhere. To this he has fitted a six-cylinder 120 h.p. Austro-Daimler engine of the type which has proved itself so successful in the Etrich monoplane, as well as in several German aeroplanes.

During last week Mr. Cody has put his biplane through various trials with great success. Using the same propeller and reducing gear as was used with the 60-80 h.p. engine formerly fitted, he has been able, thanks to having an engine of much larger size, to run the new engine at about 1,500 revolutions against 1,000 or 1,100 with the old ones.

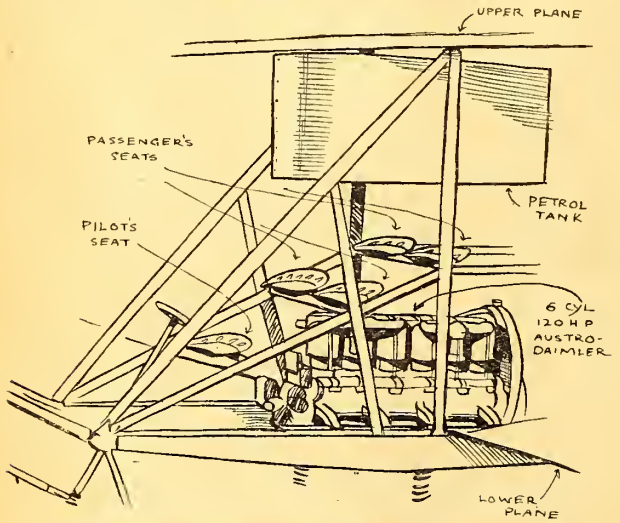
As noted elsewhere the machine has already lifted three persons with ease. Flying with three up on Friday last Mr. Cody took her up to 800 feet in three minutes with the throttle only about two-thirds open; in fact, so terrific is the power that he has never yet been able to open her full out for more than a few seconds at a time. He estimates her present range of speed to be 42 m.p.h. as a minimum, and 62 m.p.h. as a maximum, but he is always well within the truth in estimates of this kind, and 40 to 65 would probably not be far wide of the mark

Mr. Cody feels sure that even in her present form the machine could pass the War Office tests, for, strange as it may seem, she can fulfil the conditions as to packing. The planes all pack into two cases, each measuring 26 ft. × 6 ft. 6 ins. × 1 ft. 2 ins., and, by unbolting the chassis, the whole affair would fairly easily get into a case 36 ft. × 9 ft. × 9 ft.

She has already exceeded the rate stipulated for climbing, and her speed leaves her plenty of margin over the 55 m.p.h.

Mr. Cody believes it possible, with a new machine he is designing, to get 1,000 ft. up while covering one mile horizontally, so showing an upward angle of 1 in 5, about. A big angle, but apparently quite possible to Mr. Cody, judging from the actual performance of the old machine.

He controls his engine when flying by means of a foot accelerator. With his throttle half-open he flies quite easily, thus leaving a good deal of power in reserve.



The seating arrangement of the Cody machine.

Mr. Cody has fitted passenger seats behind the pilot's seat. He thinks the biplane will fly better with four passengers than it does with himself alone. It is premature to mention any of Mr. Cody's plans at the moment, but the way in which he has in the past carried out all that he has stated he intended to do leaves no doubt in one's mind that all he says he can do he will do sooner or later.

DOINGS IN FRANCE.

In English aviation circles the name of Sommer has of late not been so prominent as a year or two back, probably owing to the fact that, except during the Circuit Européan, none of the modern machines of this type have been seen in England. In France even, with the exception of the machines supplied by contract to the French Government, Sommer has made but few private sales. This lack of sales has been due chiefly to the fact that M. Sommer has for some time been experimenting with various designs of machines in the hope of producing a cheap, reliable type.

But during this entire period the Sommer schools of aviation at Douzy, Mouzon, Nevers, and Mourmelon have been working at high pressure, and have turned out a considerable number of excellent pilots, several of whom have distinguished themselves in the great contests of the past year. M. Sommer has, however, come to the conclusion that the immediate future of the aeroplane is for military purposes. Because of that he is closing his schools at Douzy, Mouzon, and Nevers and is removing his machines to Mourmelon, where he has fourteen sheds, with accommodation for fifty aeroplanes. This removal brings his main school within eighteen miles of the military camp of aviation at Reims. He has also a small school at Saint Cyr, where he trains both soldiers and civilians.

Bathiat, the chief pilot of the Sommer school, has during the last few days been testing the new Sommer carburettor, and with favourable results. The chief claim made for it is that in no possible way can it catch fire. At the same time, its efficiency seems to be high, for on January 10th Bathiat took up a Sommer monoplane driven by a 50 h.p. Gnôme engine fitted with the new carburettor to a height of 500 metres in four minutes.

The death is announced of Gilbert Le Lasseur de Ranzay at Florence. He had for some time been in hospital with typhoid fever, and died in the early morning of January 10th. Born in August, 1885, in Paris, he took his pilot's certificate (No. 479, France) on a Blériot monoplane, on April 29th, 1911. He took part in the race from Paris to Madrid, and in the Circuit Européan, but without success. More recently he flew across the Apennines, accompanied by a passenger. For this exploit alone he deserves to rank high in the annals of aviation. He had, shortly before his death, joined the Italian Army for aviation service in Tripoli. No doubt his death will be referred to by unintelligent journalists as being due to an aviation accident.

Of course, the event of the week has been Védrines' 88½ miles in the hour, on the new Deperdussin whose existence was first announced in The Aeroplane last week. Nothing like this distance has ever been covered on so long a flight round a pyloned course, but nothing in connection with aviation seems to surprise the French, whose belief in aeroplanes makes everything possible to them. Now they are calmly asking who is going to be the first to cover 200 kilometres in the hour, and are expecting to see it done any day. One hundred and twenty miles an hour in the air seems a large order when one remembers that two years ago 40 miles an hour was looked upon as a colossal speed.

A peculiar thing about the Deperdussin firm is their fondness for the number 13. The firm was started on the 13th of the month, and a number of the finest performances on Deperdussins have been done on the 13th, the latest being Védrines' record. M. Béchereau, the firm's chief designer, may well be proud of the wonderful flying done on his machines in the short time they have been at work.

The particulars of the times and distances are interesting:—

	Deperdussin. min. sec.		Nieuport. min. sec.
5 kms. ...	2 6 2-5	Old record ...	2 18 2-5
10 ,, ...	4 13 2-5	,, ,, ...	4 18 2-5
20 ,, ...	8 26 3-5	,, ,, ...	9 14 4-5
30 ,, ...	12 40 4-5	,, ,, ...	13 33 4-5
40 ,, ...	16 53	,, ,, ...	18 31 3-5
50 ,, ...	21 4	,, ,, ...	23 10
100 ,, ...	41 56 4-5	,, ,, ...	46 27 2-5
150 ,, ...	62 43 4-5	,, ,, ...	73 35

¼ hour ... 35 kms. Old record ... 30 kms. (Blériot).
½ hour ... 70 kms. Old record ... 60 kms. ,,
1 hour ... 142 kms. 430. Old record...129 kms. (Nieuport).

Greatest speed, 145.177 kms. per hour.

The dimensions of the machine are: Length, 6.25 metres. Span, 7 metres. Surface, 13 sq. metres. 100 h.p. engine.

The chief novelty of the machine is in the wings, which are of the butterfly shape, having a chord of 1.7 metres at the tip, tapering *inwards* to the fuselage.

It should be noted that this type of wing was advocated on the score of efficiency in The Aeroplane by Mr. P. K. Turner some months ago.

Coming as this victory does on the top of the wonderful records put up by Busson, Vidart, Prévost, Pascal, and others, it places the Deperdussin definitely in the very front rank.

It must be remembered that the new record was made round a 5 km. course, so the actual speed must have been well over 90 miles an hour.

Poor Ruchonnet, who was killed last Saturday, will be best remembered as a singularly unfortunate flyer of an Antoinette, and as a more successful racing car driver. No really reliable account of his accident is to hand yet, but it seems like the collapse of an experimental machine.—Pingouin Rose.

Correspondence.

The Editor of THE AEROPLANE *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* THE AEROPLANE, *166, Piccadilly, W.*

Fair Play.

Sir,—I would like to call attention to the following sentence in "Fair Play's" letter referring to the Aircraft Factory's latest aeroplane: "As for the machine being an attempt to copy the Avro, it is certainly better than the Avro."

Now I am sure "Fair Play" has not seen our latest Avros; for instance, Mr. Duigan's Avro at Huntingdon and the latest machines at the works. It is decidedly not "fair play" to speak of our machines thus, if he is not conversant with our latest practice; for how is "Fair Play" to know if it is or is not better than our latest efforts?

I can quite conceive "Fair Play" picturing one of our early attempts when he wrote this. Unfortunately, pioneers have to suffer thus. But the wise man who wants a good thing will go to the firm with experience at the back of it.

A. V. ROE.

Tuning a 35 h.p. J.A.P.

Sir,—I am very much interested in Mr. Ferguson's article on his 35-h.p. Jap engine, as I have had very much the same trouble with mine. However, I do not agree with his view that the failure of the lubrication is due to the oil escaping *via* the ports, I think it is simply due to the intense heating of the middle part of cylinders caused by so much of the exhaust gas and heat passing through the ports, the cylinders become so hot that thick air-cooled oil just boils off.

Last winter I got my engine to run for periods of an hour without any falling off in revs. simply by directing streams of cold air on the middle portions of the cylinders, and there always appeared to be sufficient oil on the pistons and cylinders. In the summer, however, the old trouble returned, even with oil running full bore, and after six minutes' flight the revs. would drop from 1,800 to less than 1,600. For consistent running, therefore, it seems that water-cooling or sealing up of most of the ports is essential, and I am just about to try the latter method.

The makers seem to think that if all the ports are closed it will lead to warping and breaking of the exhaust valves. Has Mr. Ferguson found it necessary to change his valves? I should like to know if he has run his engine for an hour at a time since he made the alteration mentioned in his article?

Re slow running with exhaust ports. I find that with flywheel and direct coupled propeller I can run my engine down to about 120 revs. per minute.

LEO JEZZI.

The Antoinette.

Sir,—In the "Week's Work" in THE AEROPLANE of January 11th you say that Messrs. Martin and Handasyde are both regretting that no more Antoinette engines can be had. Does this mean that the "Société Antoinette" remains no longer? Having always been an admirer of that fine engine and machine, I would dearly like to know.

Brighton. P. BLAKE.

[Alas! for practical purposes the Antoinette barely exists. British visitors to Mourmelon report no work doing at the sheds, and only a solitary workman in charge. It is, however, possible that ultimately a revival may be accomplished, and that M. Levavasseur may again revolutionise aviation. —ED.]

Aviation in Argentina.

Sir,—I arrived here O.K., and had a very pleasant voyage. The weather here is very bad, hot as blazes and blowing hard day and night. I have been up one time, reached a height of 400 ft., but had to come down on account of the wind. The first calm we get I am going to try an Antoinette.

There are four American aviators with six machines, all monoplanes, expected here in about a week to take part in the competition which is to come off next month. The flight is from here to Monte Video, and the prize is $50,000 paper.

I will compete if I get a machine or if I can get to manage the Antoinette by that time.

I trust everything is going well with you and your paper, and that you will eventually ram common sense into the British Government in regard to Aviation. Wishing you and THE AEROPLANE every success.

Buenos Ayres. FRANK M. BALLARD.

[Mr. Ballard will be remembered as a clever flyer of the Spencer biplane, and is expected to return to England in a couple of months to take machines out to Argentina.—ED.]

The Application of Elementary Dynamics.

Sir,—Although I agree with Mr. North that "a dispute as to the laws of elementary dynamics would be neither profitable to the participants nor interesting to onlookers," I cannot believe that a discussion as to their application, as in this case, is without profit or interest. However, to humour Mr. North as far as possible, I will make no defence of the theory expressed in my previous letter; and be content to allow your readers to form their judgment from the three letters already written.

But as to Mr. North's theory, as put forward in his letter in your issue of January 4th, I will ask him to test it by a simple experiment next time he travels by train.

Let him take the rubber motor of a model aeroplane (or any other convenient motor), and in place of the propeller ship a flat piece of wood about 12 inches by 2 inches. The 12-inch edges must be at right angles to the axis of the motor, and the 2-inch edges paralled to it. Width is solely given to this piece of wood to prevent the motor running down too quickly. To one end of the piece of wood attach a pendulum, say a 2-inch bit of string and a quarter-ounce weight.

Now, if Mr. North winds up his motor and lets it run down in the train, with the train stopped, he will have a miniature representation of a pendulum carried in a circle in still air.

And if he lets it run down with the train in motion he will have a representation of a pendulum carried in a circle in air moving with uniform velocity.

If Mr. North's theory is correct, then the bob of the pendulum when travelling against the train will have a smaller kinetic energy than when (after it has turned through 180 deg.) travelling with the train! And this loss of kinetic energy means gain of potential energy; that is, it raises the pendulum bob during the half-circle!

The amount of rise should be quite easily perceptible, for, worked out from Mr. North's formula,—

$$Ps = \frac{m\,(v^2 - u^2)}{2}$$

for any reasonable speeds of train and pendulum, the rise is not inconsiderable (even though the pendulum speed is made purposely low to make the centrifugal force the same as that of a turning aeroplane).

North Kent. JASKO.

Aeroplane Design.

Sir,—I am interested in a letter on "Design," signed "Neugierige," in the current number of your excellent paper, as I have for some time been myself experimenting with a "negative tail" type of machine.

I quite agree with you that "Neugierige" is absolutely wrong because he is trying—by means of placing his thrust high—to do what can only be done by careful design and cutting down head resistance, i.e., to obtain a very good gliding angle.

However, a negative or depressing tail does not tend towards danger for the reasons you give, because it does *not* tend to throw the nose of the machine up when the engine stops. There are two very good reasons:—

(1) The reason you yourself gave as the cause of a "lifting tail" (viz., Farman) dropping when the engine stops, i.e., due to the slip-stream from the tractor exerting an extra lift on the tail in such a case.

If a machine has a "negative" tail the said slip-stream tends to depress it more than ever, so that as soon as the engine stops the tail is, so to speak, released, and the nose of the machine is automatically depressed.

(2) If the "negative" tail is not a cambered one—and it is unlikely that it would be—and if the machine should lose speed, either by the engine stopping or by the pilot having taken her up at too sharp an angle, the tail, being flat, ceases to have its proportional effect on the machine, because a flat plane lifts less efficiently at slow speeds than a cambered one; so that again we have the tail rising, because, for the above reason, the mean centre of pressure of the machine moves rapidly backwards with respect to the centre of gravity, which

would, of course, be in advance of the centre of pressure of the main plane owing to the tail having a "negative lift."

I confess I had not thought of a negative tail having the effect of making a machine turn more sharply when it once begins to turn at all. In all my experiments with this type of machine I have never had this happen—in fact, I have obtained particularly good results, being able to get the machine to do very sharp turns indeed without perceptibly dropping.

Perhaps this is because I have been using a large vertical rudder at the tail. A slightly negative and non-cambered tail is useful for the following reason: It is particularly good for getting a machine off the ground without having to use the elevator. I have some models in which this principle is applied. They are wound up and placed on the ground and let go.

The wheels are well forward of the centre of gravity of the machine, so that it runs along with its tail skid on the ground. Then, when it has gained a little speed, the tail (being in this position slightly positive instead of negative, and also due to the cambered main plane—with its centre of pressure behind the centre of gravity of the machine—beginning to lift) rises and the machine rushes along, now rapidly gaining speed—as its tail is well up—on the wheels in front.

Then when the speed has increased sufficiently, the tail, being now negative, begins to depress, and the machine rises off the ground quite gracefully, just as if someone on board had been working the elevator.

All this sounds quite a lengthy operation. As a matter of fact, the action is very quick, because, owing to the tail keeping so well up, the machine gains speed on the ground very rapidly.

One of my models, weighing 5 lbs., got off regularly in 6 ft., and one weighing 6 ozs. in about 3 ft. The discrepancy between the two is due to the fact that the larger model had large wheels, while the smaller model had very small ones, and they both had to negotiate the same very rough and lumpy grass on the common.

Wm. Rowland Ding.

Efficiency and Stability.

Sir,—I see that Mr. P. K. Turner says in his comments on my letter of last week that his original statement that "the air above the plane has *quite as much* influence on lift as the air below it," is correct.

There seems to be very little data to hand on this subject, but my own experiments have led me to suppose that the *principal* lift of an aeroplane was derived from the reaction of the mass of air depressed by the bottom surface.

Can Mr. Turner prove that this is not so in the case of a plane set at an efficient angle of incidence of 5 degrees to 10 degrees?

I do not know the difference between a rectangular tip and a "properly designed" rectangular tip.

I did not allude to the Dunne machine as a reducer of end losses, but only introduced it as an illustration of how wings are "brought back."

The inefficiency of this machine is due to the negative angle of incidence of the wing tips, not to "plan form."

"Inherent stability" can only be obtained at the cost of efficiency, and in this case Mr. Dunne has paid much too high a price for it.

I must take this opportunity of thanking Mr. North for his remarks *re* speedometers. I quite anticipate oscillations, but do not think that they will affect the utility of the apparatus.

R. V. Tivy.

To Avoid Confusion.

As Mr. E. C. Gordon England is engaged on some important designing work with the Bristol Company it may be as well to make it clear that he has no connection with the Collyer-England machine, nor with yet another certificated pilot named England, who is in Burma. It is peculiar that there should be three Englands all well known in connection with aviation and in no way related.

Bristol Expansions.

The British and Colonial Aeroplane Company, Limited, the manufacturers of the Bristol aeroplanes, has registered at Somerset House its increase of capital from £50,000 to £100,000.

The whole of the additional capital has been subscribed and paid up by the existing shareholders, Sir George White, Bart., Mr. Samuel White, and Mr. G. Stanley White. The factory, which has turned out nearly 100 machines during the past twelve months, is now in a position to treble its former output. The company possesses the largest purely aeroplane works in the world, as well as the largest and most completely equipped flying schools in England, and has recently made remarkable improvetments in the design and types of its machines.

The performances of the new Bristol two-seated military monoplane have received unqualified praise from the military experts of the various countries who have been attending the Paris Aero Show, and during the last month several of the Continental Governments, as well as our own British War Office, have placed orders with the company.

Bristols in Spain.

At the moment of going to press comes news that Messrs. Busteed and Pixton have been making excellent flights at Madrid, before the King of Spain and the General Staff of the Spanish Army. They were flying all day on Saturday, making flights varying in duration from 15 to 20 minutes, and each of them carried several staff officers on test flights. The machines used were a military monoplane and a biplane, the former machine distinguishing itself particularly and earning high praise from the King and his chief officials. The Spanish Army only possesses two or three aeroplanes at present.

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Useful Model Work.

The Proportions of Similar Models.

Model-makers frequently desire to build a model which, while larger or smaller than one they own, or have built, shall have, as nearly as possible, the same characteristics when flying. The following table gives the necessary information.

It must be noted that the table only applies in comparing two machines of the same type of power: two motor-driven machines or two rubber-driven models. If one had a motor and one elastic the moments of inertia would be out of proportion, and the machines would behave quite differently in the air. I assume that the ratio of one machine to the other is r, i.e., that it is desired to build a new machine whose span or length is r times that of the other (r may be greater or less than 1).

Span, length, spar dimensions, etc., multiplied by r.

Then surface	will be	r^2
Weight	,,	r^3
Speed	,,	$\sqrt{r}$
Propeller thrust ...	must be	r^3
,, diameter	... should be	r
,, pitch	,,	r
,, revs. per minute	,,	$\frac{1}{\sqrt{r}}$
Motor power	must be	$r^3\sqrt{r}$
,, torque	will be	r^4
Strands of rubber ...	must be	r^2
Total energy of motor ...	will be	r^3
,, turns of ,, ...	,,	$\frac{1}{r}$
,, time of flight ...	,,	$\frac{1}{\sqrt{r}}$

Distance flown is constant.

Owing to the pressure on my space I am unable to show here how these figures are found. Suffice it to say that the calculations are of the simplest. It will be noticed that I give the torque as varying with the square of the number of strands. This is true within the limits of fair winding.

The final conclusion, that with rubber-driven models of similar type the distance flown is constant, is surprising at first. But I find it absolutely and entirely true, provided the various other proportions are as stated. In actual practice the larger machine has an advantage over the smaller. This is due to three main causes. First, owing to the larger size, the spars, etc., are easier to make, and any holes in them do not weaken them so much; hence they can be made proportionately lighter, thus saving weight. Secondly, the larger planes and propellers are easier to make accurately. Thirdly, owing to the higher speed the larger machine is less upset by air disturbance. The total advantage gained is of the nature of 5 to 10 per cent. increase of distance.

MODEL CORRESPONDENCE.

Sir,—In the current issue of The Aeroplane Mr. R. V. Tivy says he cannot see any necessity for model aeroplane competitions, and in a footnote to Mr. Tivy's letter the editor remarks that "flying-stick" contests are absolutely useless.

As one who has done a little competition work, may I be allowed to suggest that if Mr. Tivy had entered into friendly contests he would not at the present time possess a biplane with screws turning at 2,500 revs. p.m.

Speaking as the secretary of one of the chief model clubs in London, I can safely say that competitions *are necessary*. It does not follow from this statement that the "flying-stick" need be encouraged, but there are other types of models to consider.

The Blackheath Aero Club have already held contests for "rising from the ground" and "tractor" models, and at the present moment the committee are arranging a further series of events calculated to improve the members' knowledge of the science of aviation. These will include a competition for model hydro-aeroplanes, and also tests of "controlability" (steering).

Even the much abused "flying elastick" has one good point, viz., it is the most suitable type of model to use when testing propellers (or tractor screws) of various kinds, and I can personally testify to its usefulness from this point of view.

For instance, I had a monoplane which would fly an average distance of 350 yards without the aid of any following wind, but after repeatedly experimenting with new propellers of different shapes and pitch angles, the writer has evolved a pair of screws which enable that same machine to make average flights of 500 yards, and on one occasion this despised "flying-stick," weighing complete only 2¼ ozs., accomplished a flight of 2,265 ft.

These experiments were made with a view to winning a distance competition, so that particular event produced a better design of propeller.

In the same issue, on page 45, Mr. Turner says: "Model flying has descended to such a low ebb," etc. I presume Mr. Turner means "professional" model flying, with which I agree, but I certainly find that the *genuine amateur interest* is rapidly on the increase, and that therefore there is no need for such a pessimistic view of this branch of aviation.

A. B. Clark,
(Hon. Secretary, Blackheath Aero Club).

Sir,—In this week's number of The Aeroplane you ask for the opinion of club secretaries on the state of Aero Clubs throughout the country. I must endorse Mr. Johnson's remark that there is no reason for taking a pessimistic view of the situation.

The reason why so many clubs have been formed and, after a month or less, faded away into oblivion is very easy to find. All new things are taken up by a number of people in a more or less (generally the latter) serious manner, and it is a case of the survival of the fittest.

Those who form clubs and have not enthusiasm strong enough to keep the members together go to the wall.

We must not blame the model movement for these many failures, and when irresponsible persons form clubs it is perhaps just as well, in the interests of the science, that they do become extinct.

Competitions, as at present held, are for distance, duration, and steering, with surface rating, I believe, and this does not appear to encourage the serious scientific model-maker who is striving to improve his model, and not his elastic motor. The apparent uselessness of competitions has led Mr. Tivy to say that they are unnecessary, yet, may I beg to differ? There are many geniuses with but little spare money, and how are they to elaborate their ideas without the sinews of war? For the experimenter with money, of course, the notebook is of decidedly more value than an official observer, and such a worker need not enter into competition against his more unfortunate brethren for prizes.

The work of the Aero Clubs is to encourage a study of aviation by offering certificates and prizes for competition, and I am persuaded that models should be rated by the weight of the power they carry (elastic). In this way, those people whose models only fly by reason of the rubber they cram on would be penalised, and a well-designed model, which flies because it is efficient, would stand a proper chance of securing the prize. I can see no falling off in the enthusiasm of the members of this club. When their love of aviation is strong enough to carry them through such weather as we have experienced I think it is evident that they will, in the coming season, throw heart and soul into the work, and perhaps—who knows?—discover some deeply hidden secret, which will benefit science to a great extent without the loss of valued lives.

Bootle.

Alex. Grindrod Pugh.

Sir,—As founder of the ill-fated Folkestone Model Aero Club, I may be able to assist in the solution of the problem in regard to model aero club failures. We founded the club in the latter part of August, 1910, with about eight members, all of whom seemed entirely taken up with the new hobby. After a few weeks our membership increased so that we thought it advisable to obtain a workshop.

This appeared to be our downfall, for with the workshop came a few more members who were, I afterwards found, actually opposed to the very idea of aeroplanes, and soon began to cause trouble by introducing model boat building. The rather good workmanship in one or two model boats enticed a few more members to try their skill at it, and before long aeroplanes appeared to be in a minority.

However, we trudged along for about six months, by about which time we were thirty strong, and this is how they were employed: About one-half were making or going to make boats, the other half were in sections, as follows: Seven or eight aero-modellists, a few flirted with girls in the neighbour-

hood, the rest were idlers—altogether a very sorry review for us aero enthusiasts.

The committee we had was chosen by ballot, so we actually had the leaders of the boat party as a portion of the committee. I was elected chairman, but might as well have been nobody, for when a committee meeting was called for the purpose of coming to some understanding the boat party would not attend, but put up a notice that a general meeting should be held to make the club the "Folkestone Model Club."

With that the aero portion left, almost glad to get out of the atmosphere of ever-increasing opposition, but feeling none too happy at the result of their labours. I have since questioned one of the traitors as to why he preferred boats to aeroplanes. He said aeroplanes are too expensive on account of the frequent smashes, and also, to be a good model-flyer, one wants to be more educated in regard to the technical side than he could ever hope to be.

Upon giving that idea some consideration there appears to be more truth in it than I at first believed; one has only to open our weekly AEROPLANE to find it so. There we find contributors arguing with each other in a real technical manner, with such a maze of mathematics as proofs of their points that the poor beginner is frightened off. He gradually realises that he has to develop his knowledge enormously to even come up to the present state; he has no idea of making aeroplanes his livelihood, and he knows that his modest attempts at model flights are mere guess-work compared with those who have been more fortunate in obtaining a superior education. With the knowledge of these facts he retires to a less brain-racking pastime; hence our model aero club failures

I am still prepared to join a local aero club that may be formed, but no more official posts, thanks!

Folkestone. R. T. SAUNDERS.

Sir,—I trust I shall be forgiven when I say that I do not agree with Mr. Turner *re* the necessity of rigidity of the planes of models at all times. The only occasion when rigidity is needed, in my opinion (which very probably is wrong), is at the tests, when the behaviour of any particular type of plane or body is to be observed. At all other times vertical latitude is permissible, and even beneficial. I have seen several models which, though designed to fly without a dihedral, when in the air assumed a distinct curve, and flew splendidly.

For my own part, I prefer rigid planes, all my models being built in this way, yet I think there is much to be said for the other type of plane. ALEX. GRINDROD PUGH.

Sir,—I saw a short time ago in the columns of your interesting paper that Mr. R. F. Mann had at Mitcham Common succeeded in making a "Mann" monoplane fly 1,400 yards. I should be glad if Mr. Mann would kindly let me have the following particulars concerning that flight:—

1. The nature of the ground, whether a slope or level.
2. The rate of the wind (if any).
3. The number of turns given to the propellers.
4. Whether the distance was taken along the model's course, or from starting point to point of descent in a straight line.

Trusting these questions are clear, and thanking you for information in your paper, which is always interesting,

Dover. H. T. HOLMAN.

Models in the West End.

THE AEROPLANE is advised that "Mann" monoplanes, together with parts and particulars, may be obtained from The "Mann" Aeroplane Agency, 100, Crawford Street, W.

CLUB NOTES.

N.B.—Club Notes must be posted to 166, Piccadilly, to arrive not later than first post Monday morning, and should be as brief as possible.

Brighton and District Model Aero Club.—In point-to-point competition on Saturday last, no model succeeded in covering mile course. Still, fine work done by Messrs. Bate and Eburne, latter a Portsmouth visitor. Flying next Saturday at Shoreham. All communications to Hon. Sec., A. VON WICHMANN, Kingsleigh, Kingsway, Hove

Blackheath Aero Club.—Saturday last competition for silver cup presented by Mr. J. H. Dollittle for distance, duration, and steering. F. Plummer won with 49 out of 50. H. Smither (Croydon) second with 39. At Lee, H. H. Pizey gained second-class certificate with 256 yards. Flying at Kidbrooke, Lee and Blackbeath during coming week-end. Full particulars of membership from Mr. L. BROUGH, 12, Manor Road, Brockley S.E.

Birmingham Aero Club.—This week-end, W. Lunn's model flew well:- Prosser's bird-shaped wing model exceedingly slow, but always finished with excellent glide. M. Vale's new model doing better, as G. Haddon Wood with Gordon Jones' and own model A. F. MacManus' model again flying well; also Robertson's camberless-plane machine, which reached a fairly good beigbt. On Wednesday, E. Trykle got 95 secs. duration. Club bas its own private flying ground with worksbop on it, and is anxious to become one of the strong st in country. Applications for membership are earnestly requested.—G. HADNON WOOD, Hon. Sec., 8, Frederick Road, Edg aston.

Bristol Model Flying.—Meeting held on Downs on Saturday last, wind 10-20 m.p.h. Moore and Pearce's 1—1—2 P models attained heights of 50-80ft, and showed good stability. Brewerton's 2 E—1—P flew well. Howse's 20" 1—1—P rose from ground and flew 100 ft. All best flyers driven by carved propellers. Biplane illustrated last week rose in short distance. 1—1—P with drooping wings and slight lateral "vee" showed good lateral stability, and sense of direction was not affected by side gusts

When turning into wind, models seemed to rise owing to momentum obtained by flying horizontally with wind. It appears that by gliding into wind of increasing velocity "soaring" may be achieved without aid of rising currents.

Next meeting, January 20th, at Sea Walls, 3 p.m.—R. V. TIVY, 3, Royal York Crescent, Clifton, Bristol.

Paddington and Districts Aero Club.—At club worksbop last Saturday, Mr. Hurlin delived lecture on Model Aeroplane Construction, expressing opinion that time had come for technical institutions, &c., to receive Government grants for laboratories and workshops, teaching science of aviation free or within means of all. Mr Weston gave demonstration of model propellor bending. Messrs Barnes, Dixon, Hill, F. Pinniger, R. Pinniger, and Wood elected members. Subscription, 1/- per month.—Hon. Sec., W. EVANS, 133, Bucbanan Gardens, Harlesden, N.W.

Salisbury Model Aero Club, now reorganised on a sound footing, and fifteen members enrolled. Programme for year includes Saturday and Wednesday teams for distance and duration prizes, winners being those who fly one sealed mode the greates aggregate d stance and duration during month. Also monthly meeting, for all classes of models, for silver medals. Friendly contest, held last Saturday, longest flight made by Secretary, whose model flew 750 ft. Subscription, 4d fortnightly; next meeting, January 23rd, at Butcber's Row.—G J. ROBINSON, Hon. Sec., 39 Catherine Street, Salisbury.

Ealing and District Aero Club.—Club met on 13th; good flights especially by Esch and Beeching. Ten new members joined, including Mr. Raynham, the well-known Avro pilot. Readers please note general meeting will be after next Saturday's flying meeting, latter to be held in same field as described last week. Club will, when funds permit, take up gliding. Readers of THE AEROPLANE interested, please communicate with Secretary, B. J. KISCHNER, 1, Queen's Gardens, Ealing.

Reigate, Redhill, and District Aero Club.—Good turn-out on Saturday at Earlswood. A. Lewis, with Almono, made flights of over 250 yards at 80 ft. high. Cox, new member, obtained 150 yards at first attempt. Three members out with models at Buckland, Morris getting 100 yards. R. Wilson landed in a tree, when machine had covered 150 yards. M. Wilson made 200 yards. Buses run close to flying ground, Earlswood Common.—HAR. V. MAY, Hon. Sec.

St. Mary's Model Aero Club (Portsmouth)—Monthly meeting on January 13th. Decided to offer certificates, and rules drawn up. Monthly competitions arranged for second Saturday in every month. Marks given and total taken every six months. Prize for greates' marks. Glider to be built, work to be started as soon as evenings are light enough. Juvenile branch to be formed at 3d. per month. On Saturday, January 13th, members out tuning up for competition which was postponed until Saturday, January 20th. More members wanted. Subscriptions 8d. per month entrance fee 6d.—H. W. A. JOHNSON, Hon. Sec., St. Mary's Vicarage.

Worcester Model Aero Club (Victoria Institute)—Club meet on Saturday, January 13th. Fine flights witnessed by small crowd of interested spectators. Club record broken by Mr. F. Smith, with 110 yards, Mr. P. H. Colton being close rival. Meeting as usual Saturday 20th, on Pitcbcroft, at 3 o'clock. Several members intend to attack somewhat low club records.—E. W. HARRISON, Assistant Sec.

City of Liverpool Aero Club.—Meeting January 22nd, at 7 p.m., at "Wayside Cafe of City Beautiful," Harrington Street. Members reminded that yearly subscription of 5s. is now due.

Hackney and District Aero Club.—At inaugural meeting subscription rates, etc., settled. Decided to hold demonstration on Hackney Downs, Saturday, January 27th, at 3 30 p.m. Readers of THE AEROPLANE in district welcomed. More members wanted. Write for particulars to Hon. Sec., BRUCE H. LONGSTAFFE, 97, Jenner Road, Clapton.

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Vol. II.] [Registered at the G.P.O. as a Newspaper.] THURSDAY, JANUARY 25th, 1912. No. 34

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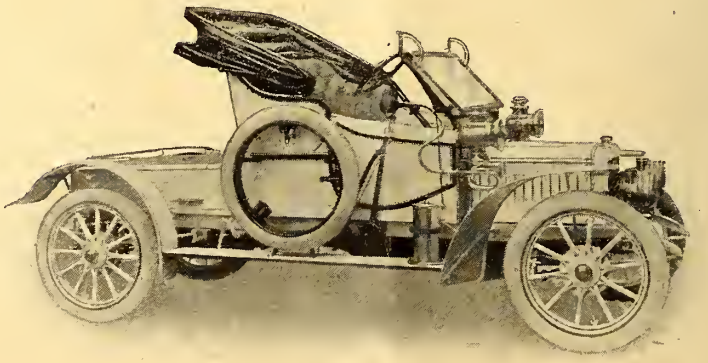

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THAT £75.

The Reserve Officers' Course.

Judging from various correspondence, there still seems to be a good deal of anxiety among officers who have taken their pilots' certificates on the subject of the £75 grant promised by Colonel Seely some months ago, and anxious inquiries at the War Office do not seem to produce any immediate response in hard cash, though they have produced some strange information.

So far as the authorities there are concerned, their intention seems to be that no officer will get that £75 until he is attached to the Air Battalion for the "Refresher Course," to which Colonel Seely referred when announcing the grant in question, this "Refresher Course" being apparently known officially as the Reserve Officers' Course.

Now, naturally, the common sense way of dealing with the question would be to attach to the Air Battalion about a dozen of the officers who are already anxious to start their further course of training, and let them have the equivalent of about a fortnight's serious flying. This could easily be done considering the fact that there are, in working order, but not in use, several machines which, though not suitable for actual active service, are quite good enough to keep Army aviators up to the ordinary certificate form, and even to allow them to reach a considerably higher stage of ability as flyers, under the favourable conditions available on Salisbury Plain.

Unfortunately, the uncertainty of British weather would make a definite period of attachment practically an impossibility, for it is quite possible that one batch of officers might be with the Aeroplane Section on Salisbury Plain for a fortnight and get no flying at all, whereas in the succeeding fortnight the next batch might get three or four hours' flying a day. This is proved by the fact that up to the present there has been very little continuous flying this January, whereas last January there was flying practically as long as daylight lasted every day of the month. Therefore, one would like to suggest to the authorities that the Refresher Course should consist of so many hours spent in the air rather than a certain definite period of attachment to the Air Battalion.

A Month's Work Wasted.

It appears, however, that the unfortunate Air Battalion has got to contend not only with the British climate, and a singularly discouraging staff at its own headquarters, but with certain eccentricities of ordinary Army Regulations, for the writer learns that during the month of March, which will probably be exceedingly fine flying weather, specially for the occasion, all Air Battalion work will be closed down in order that the various component parts of the Battalion may undergo their annual course of drill and musketry. This is certainly a matter which will have to be rectified in the future, because it is absolutely absurd to suppose that a whole month of possibly decent flying weather is to be wasted by the whole Air Battalion at once. It should surely be possible to spread the drill and musketry training out among the regular work of the Air Battalion during the year.

But, be that as it may, the opinion at the War Office seems to be that January and February are unsuitable months in which to attach officers to the Air Battalion for the said Refresher Course, and no aviation work at all will be done in March by anybody. Therefore, no fresh officers can be attached until April at the very earliest, and probably not until May.

It seems quite likely that by that time the particular clique which is doing its utmost to make the Air Battalion purely and simply a branch of the Royal Engineers will have succeeded in obtaining the appointment of sufficient Engineer officers to fill up all possible vacancies on the permanent establishment, by the process already outlined of appointing Engineer officers to the Balloon Company, then training them to fly, and afterwards appointing them to the Aeroplane Company, so that officers from all other branches of the Service may be effectually crowded out.

The Need for an Effort.

The writer, therefore, suggests that all officers who have already got their aviators' certificates should put forth their most strenuous efforts, and bring to bear any influence they can command in order to prevent these "jobbed" appointments, for, with Government purchases of machines being made in driblets of one or two machines per month, it will be quite possible to keep every available machine at work in the hands of the Engineer officers on the permanent establishment, and so continually stave off the attachment of those officers who have already won their certificates with the very simple excuse that it is no good attaching them because there are no machines for them to fly.

On the face of the way this Air Battalion scheme is being worked, it appears to be one of the least creditable performances in the recent history of the Service, and it is only to be hoped that as soon as Parliament reassembles, as it will do before very long, a really serious campaign will be started by

members of all parties to have things put on a proper basis.

Fortunately, aerial defence has very earnest friends in the Cabinet, and actually in the War Office itself, and they may be depended upon to do their best, but their efforts must be seconded by everybody who can bring any influence to bear, and it is to be hoped that every officer who is genuinely interested in aviation will exert every effort to upset the present methods, and will endeavour to secure independence for the Air Battalion and Free Trade in army aviators.

THE WORKER AND THE FIGHTER.

The writer has been severely taken to task, by a naval officer be it stated, for remarking recently that by nature and training the Royal Engineer officer is neither a sportsman nor a fighting man. The naval man seemed to regard the remark as an insult to an excellent branch of the Service, and himself bore witness to the fact that the Sappers in bulk are fine sportsmen, and frequently ready for a row.

Now, rightly interpreted by a man of the high mental attainment of the representative Engineer officer, the remark in question would be in reality a carefully veiled compliment. It is a convention in this country to set the sportsman on a pinnacle and admire him, but one of our greatest philosophers has described fox-hunting as "the unspeakable chasing the uneatable," and the essence of most sport is contained in the French idea of the English sportsman :—"What a fine morning! Let us go out and kill something."

Further, the efforts of all our greatest statesmen have been for many years directed towards averting all kinds of fighting. Duelling was prohibited nearly a century ago, and to-day every disagreement, which would formerly have been decided by a stand up fight, whether between nation and nation, or employer and employee, is now submitted to arbitration. Hence the Hague Tribunal and Sir W. Askwith. Therefore, *prima facie,* the man who is neither a sportsman nor a fighting man, and who does not rejoice in killing either beasts or men, must be on a higher plane of mentality than his fellows, and one may assume that it is a more worthy occupation to design a nation's barracks than to direct its battles.

Nevertheless, the best safeguard against war is preparation for war (misquotation—original by Bismarck or Gladstone), and the mere fighting man is a necessity. But it is a mistake to mix up the two occupations. "He also serves who only stands and waits" (acknowledgments to another philosopher, whose name escapes one), but the waiter need not, in the inspired words of Mr. Owen Seaman—"plunge into the melée, and pound his opponent to a jelly." Let us, therefore, put the men who have had the misfortune to be trained as fighting men into the fighting jobs, and let the men of high mental attainments do real engineer's work.

The Air Battalion Fiasco.

Under the above heading Mr. C. C. Turner, that most valuable ally of The Aeroplane in the crusade against the maladministration of our aerial defence force, lays bare another piece of official imbecility. Mr. Turner tells the story in last Sunday's *Observer,* and his comments are too good to spoil by curtailment, so they are given in his own words :—

"It is with careful deliberation that I use the word fiasco to denote the pass to which the Air Battalion has come : it is the word that applies exactly to the situation that has been brought about, not by the officers, non-coms. and men of the battalion, but by the administrative officials at the War Office, who have the supreme direction of the 'Fourth Arm.'

"Two things are wrong, and either would suffice to reduce the battalion to impotence. One is the financial dilemma in which the battalion always finds itself owing to the refusal of the authorities to allow an adequate sum for working expenses ; the other is the determination of someone in authority to make the force a section of the Royal Engineers in defiance of the intentions entertained by the Army Council even so recently as last autumn.

"The poverty of the battalion is revealed by the fact, published in the *Pall Mall Gazette* last Wednesday, that officer-pilots have been commanded to restrict their cross-country flights to the route between Salisbury and Aldershot, a route with which they are all familiar, and which, therefore, offers them no instruction. The reason for this absurd order is that expenses, even in petrol and oil, must be kept down to the finest point, and that there must be no risk of occasional transport by rail due to a breakdown. In short, flying is not encouraged. I am able to supplement the information given during the week, and to say that expenses entailed in last year's work have not yet been met, and that there is no apparent prospect of the current working expenses of the battalion being defrayed. Needless to say, practically no equipment exists for taking the field in an emergency, and, instead of the fourteen officers of the paper establishment, there are only seven or eight, of whom only six are pilots.

"Every one of the officers is keen, and much dissatisfaction exists at the restraints imposed upon them. They are men who are every whit as good as those of whom the highly efficient French Air Corps are formed, and they labour under the humiliation of the consciousness that the British Air Battalion is the object of the pity of French and German military aviators.

"The authorities are, perhaps, aware of the importance of experience in cross-country flying, for they have no objection to officers of the battalion making themselves proficient in this respect, provided that they do so at their own expense. Permission has been granted to them to qualify for the Royal Aero Club advanced certificate, which includes cross-country flying, but they must do this at their own risk, and any damage sustained by the machine must be made good out of their private means! On the samt terms they may compete for the Mortimer Singer Army aviation prize. It would be superfluous for me to point out the vital necessity to military aviators to become proficient cross-country flyers, expert aerial navigators and highly trained scouts. For these things constant practice is necessary, and French and German military aviators are continually engaged upon this kind of work."

In the face of this parsimony where the expenses of the Aeroplane Company are concerned we find this precious "Air Craft Factory," as it calls itself, squandering money on expensive equipment, as mentioned elsewhere, while the Aeroplane Company is starved for men and machines and money, cramped by absurd restrictions, hampered in all its movements.

We have British constructors still waiting for the orders promised to them months ago, while the superintendent of the factory waves his hands affably, and explains blandly to the British Press that "it is not the intention of the authorities to manufacture machines in quantities," and that it will be his gracious pleasure to assist the said constructors with the vast experience of the "Factory," or words to that effect.

We have fine flyers who have learned at their own expense waiting for their promised opportunity to fly in the country's service, while Royal Engineers are "jobbed" into the positions belonging by right to more enterprising soldiers.

We have France and Germany day by day increasing their air corps by adding new machines and men, while we refuse to buy British aeroplanes, and the Government "Factory" tinkers with "novelties" which are already obsolescent, and booms its latest efforts in the public Press like any American dry-goods emporium.

Thank you, Mr. Turner. Fiasco is the word.

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AIR CURRENTS.

Locomotion Simplified.

The number of weird schemes evolved by various people with a view to making improvements on the means at present in use for the construction and propulsion of aeroplanes gives one reason to believe that if they would turn their thoughts to other forms of locomotion they would find ample scope for their powers of invention. The following ideas are respectfully suggested to them as being quite worthy of their deepest attention :—

Motor-Cars.—Though these undoubtedly useful and convenient machines have up to the present time been successful up to a certain point, this has only been attained by the expenditure of an entirely disproportionate amount of power. Now the horse, whose method of progression may be safely taken as an excellent example of the natural means of locomotion, trots along on four legs, as every observant person knows—he does not go on wheels, even though a visit to the nursery might incline us to the belief that he does. Here we have, very simply explained, the reason for the inefficiency of the motor-car, and it is safe to assume that were these vehicles to be constructed with four legs, made to move after the manner of those of the horse by some simple machanical means, we should be able to obtain much more speed for considerably less power. In proof of this latter statement it is pointed out that one horse can attain a speed of 15 m.p.h., obviously at the expenditure of 1 h.p. From this it can be conclusively proved by simple mathematics that a 10 h.p. motor-car should be able to travel at the speed of 150 m.p.h. Will it? Not on your life, and never will until it trots on legs. This is just as certain as the fact that no aeroplane can be really efficient unless it flaps its wings, which we know to be the case, for the man-who-ought-to-know-better has told us so.

Horses and Carts.—These exist to-day in practically the same crude form as they did when first invented; that is to say, they are capable of moving in two directions only, forwards and backwards. No cart is fit to be used as a means of transport unless so designed as to be moved sideways also. Anyone who pauses for an instant to consider the extreme value of this movement in driving amongst heavy traffic, or in bringing carts to or from the kerb, cannot fail to wonder that carts have survived so long without it. This idea is commended to those who claim that an aeroplane, before it can be really said to fly, should rise off the ground vertically " like a bird."

Railway Trains.—Early in the last century an ingenious person named George Stephenson, having constructed a practicable steam locomotive, attached thereto a number of carriages for the conveyance of passengers and goods, and set the locomotive to pull them along. Slavishly following this ingenious (but unscientific) person's example, other constructors of railways have adopted the same (or similar) methods, when really a railway train should be run without any motive power at all. The reason for this will need no explanation to those who believe aeroplanes should fly without an engine, and they mignt take this subject up in order to gain a little experience. Three methods are suggested, all very simple, and only needing the details worked out. The first, to have every railway station at the top of a hill and let the trains run downhill to the next. The second is just to keep the trains stationary and allow the earth to slide round underneath them in making its diurnal revolutions. While the third is to collect the electricity emanating from the telegraph wires by the side of the railway by means of an aerial stretched along the carriage roofs and to use the power for driving electric motors.

Ships.—The design of a mechanically operated method of preventing ships from rolling, for the greater comfort of seasick passengers, might serve as an amusing pastime for mechanically controlled automatic stability device inventors. Pitching and the bodily vertical motion of a vessel at sea, being two of the chief causes of *mal-de-mer,* may be neglected, while the strains imposed on the hull by holding it rigid in a seaway should be left to the builders to deal with. Constructional methods, such as small metacentric height and the fitting of bilge keels, are disallowed; it's not playing the game, and doesn't give the inventor a chance.

To the inventors of speedometers on the pendulum principle, *the utility of which for marine navigation can hardly be exaggerated,* it is suggested that they should first construct a " patent log " for accurately recording the distance run by a ship, irrespective of currents, speed of the ship, state and direction of the sea, and distance lost by bad steering. This should be a comparatively simple problem, and, in combination with a chronometer keeping exact Greenwich Mean Time, would enable the captain of the *Mauretania* to determine with certainty, at any hour of the day or night, whether his ship was in the North Atlantic or South Pacific Ocean.

When these ideas have been perfected more of a similar nature can be supplied, and in the meantime constructors of real aeroplanes may possibly be allowed to get on with their work in peace.

S. P. E.

The Fortunes of War.

(A sympathetic attempt to put the outraged feelings of M. Duval and M. Obre into words.)

Paris, January 16th.—A telegram from Tunis states that a wireless message has been received there that Italian torpedo-boats have seized and taken into Cagliari, Sardinia, the French steamer *Carthage,* which carries the mail between Marseilles and Tunis, and which had an aeroplane on board belonging to the airman, M. Duval.

The Italian authorities, considering M. Duval's aeroplane as contraband of war, landed it, and parts of another machine belonging to M. Obre, at Cagliari.

The two airmen, who had previously arrived in Tunis, have entered a protest at the Residency, as they intended organising a flying meeting in Tunis.—Reuter.

Time was, when coming from the Continong,
I used to smuggle more or less—p'raps more—
And must confess I did not think it wrong
Thus to elude the clutches of the Law.
Ingenious were the schemes that I devised
To keep th'Official Eye from my cheroots,
And one there was expressed himself surprised
To find them in the lining of my boots.

I learnt to fly some little time ago
(And did it, I may add, without a smash),
But so expensive was the game, you know,
I *had* to find a way of raising cash.
At last I hit upon a splendid plan,
And love of sport, not quite unmixed with greed,
Sent me to Tunis that the native man
Might see me put to shame the Arab steed.

Now everything is spoilt. Some silly ass
Came on at Cagliari, waved his hand
At my machine, and collared it, alas!
He said that aeroplanes were contraband.
So now I'm busy thinking out a way
To *smuggle* aeroplanes, and live in hope
Of patenting a scheme some future day
For faking mine to look like bars of soap!

D. M. H.

Humour in the L.C.C.

Roof Garages for Aeroplanes.—In the course of the last meeting of the London County Council, Mr. R. M. Sebag-Montefiore asked the chairman of the Establishment Committee whether, seeing that the new County Hall would not be ready until 1916, his committee would consider the advisability of providing a roof garage for the use of members' aeroplanes. Mr. Dove (chairman of the committee) replied that as aviation had not yet reached the stage of being an exact science, he regarded the river as a safer landing place than the roof of the new County Hall. If by 1916, however, the science had advanced to such a degree that a landing stage was desirable, no doubt the proper facilities would be provided.

A New Use for Dirigibles.

It appears that about 80 per cent. of the youthful female population of Farnborough and the surrounding country are now the proud possessors of handbags made from fragments of the Lebaudy dirigible. It is said that they are now spending fruitless hours trying to procure sufficiently large pieces of the various burst envelopes of the *Delta.*

Dr. Hankin on Animal Flight.

Although the lecture on the "Development of Animal Flight," by Dr. E. H. Hankin, at the Royal United Services Institution on Monday, was primarily of scientific interest, Dr. Hankin himself treated his subject in so cheerful a manner that perhaps I may be forgiven if I refuse to take it very seriously myself, and interject my own deductions.

After pointing out that in insects wings apparently originated from elaborated tracheal gills, the lecturer showed that the primitive flying insects had six wings, and that these wings were double surfaced, being, in fact, flattened bags, whereas in modern insects a single membrane suffices. This seems to me to point to an attempt on Nature's part to build double-surfaced triplanes, but, so far as modern insects are concerned, single-surfaced biplanes do not seem highly successful, as they never fly in a wind. Dr. Hankin also showed that primitive insects could not fold their wings, a structural error usual in aeroplanes.

Passing on to flying fishes, he showed that the earliest types had no strong fin ray in the leading edge of their wings, whereas in the modern types the front members are stronger; he also showed that the tail fins fly with a considerable lift. This seems to me to justify placing the main spar in the leading edge, but it also justifies the lifting tail, which is not quite in accord with modern ideas, though the lift seems small, and may, perhaps, only be used to avoid producing a depressing tail.

Dr. Hankin said that some observers alleged that a flying fish only flapped its wings when slowing down, but this was probably due to the fact that at top speed the vibrations could not be seen—e.g., a propeller only becomes visible when the engine is throttled.

He put the flying fish's best speed at 20 metres per second, for about 4 seconds, and its distance record at about 450 metres, the balance of the distance being done apparently at gliding speed. He had worked out the loading on the wings at about 2.3 lbs. per square foot. He remarked that the flying gurnard also flapped, but was not known to glide.

On the question of wing design, he mentioned that in birds any transverse stays were on the lower side of the wings, and never on the top.

Passing on to the vertebrates, Dr. Hankin said that Nature apparently found difficulty in making them fly, owing to the centre of gravity being too far back. He showed pictures of Dimorphodon, a primitive animal in which the fourth finger of the hand was enormously prolonged to support the wing membrane, being, in fact, a prehistoric main spar. The feet had a similar, but smaller extension—which, I presume, indicates variable tail-planes, without a fixed empennage. This animal had an enormous head, an attempt, as Dr. Hankin said, to get the centre of gravity forward. He also instanced it as the first record of an aviator suffering from swelled head.

The next stage was that of the Pterodactyls. Those found in Europe had tails, whereas those in America had not. (This, I take it, accounts for the earliest type Wright machines.) Later types had a bone in the middle of the arm, on the front edge of the wing, which Dr. Hankin imagined to have been developed for the purpose of altering the camber.

The lecturer then pointed out that birds were evolved from reptiles. In birds the hip bone extended forward of the leg joint, and Iguanodon had the same peculiarity. Some authorities imagined that wings were developed from the extended arms of fast runners, but he pointed out that the most primitive flyers had big limbs in front, whereas the runners had their big limbs behind.

The earliest genuine birds had teeth, and had only six or seven primary feathers. They also had three claws to each wing, and some authorities believed these claws to have been inside the wing—personally, I suspect they were really wing-tip skids for use in bad landings, as the owners must have been shockingly poor flyers. This theory is borne out by a picture shown of the remains of one of these birds, found in lithograph among coal strata in Germany. It looks likely an exceedingly bad prehistoric "pancake" *atterrissage*. This particular bird suffered from the name of Archæopteryx, which might account for almost anything.

Dr. Hankin, in describing the action of bird's tails, said that a bird used his tail to check a turn or correct a bank, not to elevate, and incidentally referred to the box-kite type of biplane as a machine "with a tail like a bathing machine"—rather an apt expression. He averred that in order to glide down, a bird puts his wings up at a dihedral and raises his tail. Also in cornering he warps one wing only. Further, he changes the camber of his wings to slow up or glide faster. And, in addition, he can fold his wings. An aeroplane does none of these things.

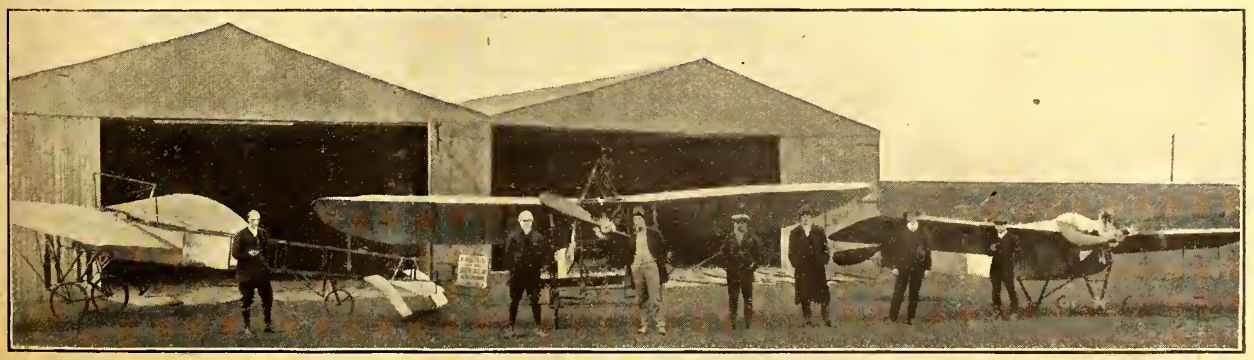
On the other hand, Archæopteryx carried much weight on his tail, and moved it as an aeroplane does for elevation, whereas a modern bird advances or retracts its wings. Nature's early flyers could not change their wing camber. Altogether, the aeroplane had many features like those of Nature's failures of millions of years ago, and Dr. Hankin said he would like to see a modern bird's controls tried on model aeroplanes.

Here, perhaps, I may be permitted to remark that this kind of reasoning is exceedingly dangerous, for one might just as reasonably go out and study the hoofs of one of our few remaining cab horses in order to learn how to make tyres for motor-cars. One needs to study Nature very warily. As Mr. Blin Desbleds remarked on one famous occasion, "When the Chief Designer of the Admiralty is designing a Dreadnought he does not do it by contemplating a bloater." and we do not steer our ships by bending them in the middle, nor do we propel them by flapping their tails. The superiority of Man over Nature seems to lie in the fact that Nature cannot make a satisfactory revolving joint. Hence the superiority of wheels over legs, and, analogously, of revolving propellers over wagging tails and flapping wings. Already our aeroplanes travel faster than the fastest birds, and fly higher and in stronger winds than any bird with a properly homologated record. Still, carefully studied, birds may teach us much. Variable camber is certainly one of the most important things we still have to invent. Possibly the proper use of the tail in conjunction with the warping and varying of the dihedral of the wing is another. Nevertheless, we may succeed on the very lines of Nature's failures. Probably the prehistoric sportsman who was crushed by a boulder rolling down a hillside did not appreciate that it was a failure on Nature's part in the production of locomotive rolling-stock.

The Chairman (Sir George Darwin), discussing the soaring of birds, remarked that there were other causes of eddies than the heat of the sun. Currents of air in different directions caused waves, such phenomena as "mackerel skies" resulting, and he imagined birds used these waves in soaring.

In the discussion which followed, Colonel Fullerton and Messrs. Frost, Cooper, Dunne, and one or two others took part, but they did not raise any notably fresh points.

[N.B.—There will be a discussion on Soaring Flight at the Royal United Service Institution on Tuesday next, at 8.30 p.m. Members of the Aeronautical Society may introduce visitors without tickets.]



The Chanter School at Brighton-Shoreham. On the right is the first Nieuport type machine built in England.

French and German Expenditure on Aeronautics in 1912.

By W. E. de B. WHITTAKER.

One is so accustomed to thinking of Great Britain as being hopelessly behind other nations in the size and form of its air corps that one is distinctly surprised to find that the French people are becoming alarmed at the slow progress (!) shown in their own aerial force.

Subscriptions are being raised in the country that each Department may present an aeroplane to the army, and appeals are daily addressed to the political Press by distinguished aerophiles, impressing on the Government the dangers of delay. The cause of this agitation is the discovery by the French public of the fact that during the last year Germany has silently and steadily been adding large numbers of aeroplanes to the German army. Too late France finds it unwise to point out with glowing words each little step in the increase of her aerial force. It is not the first time that Gallic garrulity has aided the taciturn Teuton. She learns the lesson for a day, and forgets it the next.

France pries but little into the changes in the armies and navies of other nations than Germany. But in the affairs of that country the people of France take an abiding and sardonic interest. To the French all memories fade rapidly save those of bitter defeats in love and war. The memory of those bitter days in 1870-1, when the eagles of France were trampled in the mud, is vivid in the minds of all Frenchmen. Fretful children are still hushed by the threat of bringing the German ogre. In many private houses and some military messes (few of which exist nowadays) a fervent toast is drunk nightly "To the revenge," and all true Frenchmen dream of the day when French troops will march victorious through the streets of Berlin. Hence the great anxiety in Paris when Germany happens to score a point in military organisation.

Photograph by Herbert and Son.

The "Water-Bird" well up over Windermere.

Up to the present Germany has allotted a very small sum for the purchase of aeroplanes in the annual estimates, though using in secrecy for this purpose large sums of money from other votes. But there is a limit past which secrecy cannot go, and, recognising that, Germany publishes this year some details of its financial intentions in regard to aeronautics. Enough information is given to worry the French Government considerably.

Let us examine in rough detail the French Army Estimates for 1912 in so far as they deal with aeronautics in general. The total vote is for 7,200,000 fr. (£288,000). Of this sum certain amounts are disposed as follows:—

Development and expenses of aeronautical services	4,421,750 fr.	(£176,870)
Prizes and compulsory orders of machines after military trials at Reims last year	1,000,000	(£40,000)
For the purchase of dirigibles ...	1,000,000	(£40,000)
	6,421,750 fr.	(£256,870)

leaving altogether a sum of 778,250 fr. (£31,130) for the purchase of the forty aeroplanes laid down in the Budget of this year.

On the other hand Germany devotes the equivalent to 16,000,000 fr. (£640,000) this year to aeronautics. The whole of this sum is to be spent on aviation alone. A separate vote is arranged for dirigibles. Of the aviation vote, half the entire sum is allocated for the purchase of flying grounds and the building of sheds, leaving 8,000,000 fr. (£320,000) for the purchase of aeroplanes. With this large sum Germany will be able in one year to form the largest air corps of the world. She has already a fleet of twenty-six dirigibles, a certain number of which are capable of a speed of forty-five miles an hour, thus making it possible for them to fly in much worse weather than previous power-driven balloons.

The one predominant feature of the French vote is the waste of money in the prizes granted at the military competitions. It is hardly business to give the winner a cash prize of over £30,000, exclusive of orders for machines. Would it not have been better to give a more moderate prize and placed a certain number of orders with the winning manufacturer? True the Government feared that Fate and the weather and the strange things that occur to aeroplanes might have eliminated the better machines one by one and left some biplane of hideous aspect and weird design to carry away the rewards of first place, including a large number of orders.

The Government therefore increased the prize and decreased the compulsory orders. But it seems an expensive way of avoiding a possible vagary of Fate. Twenty machines in all will come to the French army as a result of the trials at an average cost to the country of £2,000 each.

As to the amount spent on dirigible balloons little can be said, as, if the dirigible is efficient, then the sum expended is hardly enough, whereas if the general view of these machines is correct, then the money is all wasted. However, one could hardly expect France to do less, in face of the knowledge that Germany has a large fleet of dirigibles in existence, and is adding to it from time to time.

In fact, there is but little to criticise in the details of the estimates. The entire vote is quite inadequate—that is all. To rest on the laurels of previous successes is a common fault of nations, but it is not good business. The greater successes one makes the more are ambitious rivals inspired to make increased efforts and the more difficult it is to maintain the position one has won.

At the end of this year, if the estimates remain unchanged, France will have in her possession 234 aeroplanes, as against

400 (at least) in the German army, and ten dirigibles against twenty-six; in fact, the German air corps will become in one year practically twice the size of that of France.

The opinion in France amongst those qualified to judge is that a sum of not less than 25,000,000 fr. (£1,000,000) is appropriate to the work it is necessary to do this year in military aviation. With this money not only might sufficient aircraft be bought and men trained, but the entire force could be arranged on a firm basis for the future. Initial expenditure is always high, so that there need be no fear that, if large sums of money were granted now, the same rate of expenditure would be maintained in future years. A large amount of money would be spent this year in purchasing ground, building sheds, buying machinery and tools, as well as in the purchase of new machines. But in future years these items will largely disappear, and even the number of new aeroplanes purchased will decline as soon as the air corps has reached a certain substantial size. Moreover, the reduction in the cost of manufacture, owing to large contracts and better methods, will make a further difference on the right side. The French people are determined to hold the mastery of the air, and they do not grudge the money. It has come as a surprise that so inadequate a sum has been placed on the estimates. It must, of course, be remembered that had Germany published such startling figures earlier in the day the French vote would not appear so ridiculous. So soon as the French Government has decided in what way to arrange itself and on what day to resume the duties of government perhaps this will receive further attention.

[Strangely enough, after Mr. Whittaker's article had been put in type, news was received that the French War Office had asked that the sum of £880,000 be expended on aviation.—Ed.]

Other nations are providing more or less largely for increases in their aerial fleet during the next year. Italy will have shortly ten dirigibles and close on a hundred aeroplanes. Russia, apart from its central force, intends that each regiment shall possess an aeroplane. Austria-Hungary has formed several aviation camps and has purchased a large number of aeroplanes.

England has one curious little engine-driven gas-bag, of whose little flights one occasionally reads in the society columns of various daily newspapers. There are also several wrecks of one-time dirigibles lying in melancholy sheds at Farnborough. A few enthusiastic officers fly very well and very bravely on a few aeroplanes on Salisbury Plain, whilst the Government "factory" experiments in order to aid and lead into the right way the English constructor.

No doubt one day we shall wake up, but it would be well if those in authority would remember that the peace of the world will not be maintained indefinitely in order that England may experiment with and perfect its aerial fleet.

The Australian Defence Scheme.

In connection with its scheme for the defences of Australia the Commonwealth Government intends to organise a school of aviation, and has instructed the Commissioner-General for the Commonwealth to make certain inquiries as to equipping the said school with machines and pilots. Applications should be addressed to Captain R. Muirhead Collins, R.N., C.M.G., Secretary, the Australian Commonwealth offices, 72, Victoria Street, S.W., on or before February 1st.

The cable received by the High Commissioner's office says that it is proposed to appoint two expert mechanists and aviators for the defence department, but it is not quite clear whether this means two men who are mechanists and aviators or whether two of each are required. The salary per annum will be £400 each, and this will include everything, except travelling expenses. Candidates should state their qualifications and experience, also whether they have any military experience, whether they are born or domiciled in Australia, their age, and whether married or single. The Commonwealth accepts no responsibilities for accidents. Applicants for the post have also been invited in Australia. The selected candidates will be appointed for a twelve months' probationary period, and the appointment will then be confirmed.

As regards machines, tenders and quotations have been invited from approved firms for two monoplanes and two biplanes, together with spare parts. The successful tenderers are to undertake to put two aviators through a course of instruction in the manufacture of machines, and to familiarise them with the machines so as to enable them to make all necessary repairs. Tenderers should also submit schedule prices for extra parts.

There are only two points about the above proposals which seem to call for comment. One is that as the aviators will be under orders, and will be expected to fly when instructed, and not when they like, £400 a year does not seem any too large a salary, for obviously if a man were injured while flying under orders during the first year, his £400 would not go very far, in view of the fact that the Commonwealth accepts no responsibilities for accidents. It should also be noted that the successful tenderer is to instruct two aviators in the manufacturer of machines, which seems to suggest that they can go back to Australia and build machines exactly like those which have been bought, so that the purchases from the successful tenderers may very well begin and end with the orders then in hand.

The Government Grant for Aeronautics.

The Aeroplane learns on reliable authority that, thanks to the starvation policy pursued by the Government in the matter of military aeroplanes, the Army Aircraft Factory now finds itself in the happy position of possessing a surplus of cash out of last year's estimates for aeronautics, and that this is being spent on a variety of material which is not actually necessary at the moment, so as to get rid of the cash before the end of the financial year. Naturally those most concerned are afraid that if a surplus is shown it will be docked from next year's allowance, but how much better it would have been if aeroplanes had been bought and some attempt made to form a properly equipped Air Battalion months ago. Incidentally it should be noted that the money is not being spent on buying aeroplanes for the officer-aviators, but on instruments, experimental apparatus, and so forth for the Army Aircraft Factory.

French Naval Aviation.

Much has been done in France for military aviation, but practically no money has been spent on the naval side of flying. Several officers, such as Lieutenants Delage and de Conneau, have been trained in the army aviation schools, and have, as the world knows, distinguished themselves, but no naval aviation corps has so far been formed and no official tests have been made of hydro-aeroplanes.

The decision of the Ministry of War to apply to Parliament for close on £1,000,000 has been followed by a similar move though on a smaller scale. M. Delcassé, Minister of Marine, has, during the past week, been holding meetings with the heads of departments and the Chief of the General Staff (naval) to decide on the course to be pursued. The arrangement of details and the development of a comprehensive plan of action has been entrusted to Captain Daveluy, and a vote of between £40,000 and £50,000 will be asked for from Parliament. On even this small sum, as Captain Daveluy points out, a great deal of useful work can be done. W. E. de B. W.

Italian Notes.

After awaiting with great interest the actual employment in war of the two small dirigibles which were sent out with their collapsible hangars to Tripoli in November last, our hopes have been, like the hangars, dashed to the ground by the elements, so much damage having been done that the envelopes of both vessels have had to be sent home to be repaired. The hangars had suffered many moves during the last year; hence, on the unsuitable coast soil and on the approach of a cloud burst they involuntarily collapsed.

Meanwhile, the preparation of *P.I.*, which has been chiefly regarded as an object-lesson for some long time back, and the Government's apparent intention of putting her again into active life, suggests that a very real need for a dirigible has been felt by the military commanders.

Large sums are again to be devoted to the country's aerial progress, as during last year, and a motor competition may be announced later. Several officers have taken their ordinary tickets at the French schools during the recent festive season, France, fortunately, being still willing to teach foreign officers and sell machines to foreign and possibly hostile Powers.

Conciliatory pamphlets are to be distributed to the Arabs, by way of a change, by the bomb-throwing 'planes. I opine that the enemy will treat the tracts very gingerly for some time after their arrival on terra firma.

There is nothing doing here, every machine having been grabbed for the war, except the Savary at Somma, which no one knows how to fly except a chap who is in Tripoli with a Blériot, or something of that sort.

T. S. Harvey.

Lateral Controls.

By P. K. TURNER.

The main idea of lateral control in an aeroplane is, of course, to produce a force tending to raise one wing and lower the other. In almost every case this is done by producing a lift: the one exception, as far as my memory goes, is the principle adopted in the Star monoplane exhibited at the 1910 show at Olympia, and possibly in the Coanda: the use of several flaps on the tail, used so as to twist the whole machine bodily *via* the fuselage. The rotational force produced can only be small, and the strain on the fuselage is very heavy, so that this method may be dismissed at once as altogether inferior. We may assume, then, that lateral control is to be obtained by producing a difference in lift between the two wings. Now this may or may not involve a difference in their drift, and one of the most important points in considering the respective merits of various methods is the difference of drift which they produce. It would seem on the face of it that the best method is that which produces no difference in the drift between the two wings.

Rudder Stabilising.

It is necessary first to consider on what lift depends, so that we can see the effect of varying the different factors. The lift of a plane varies with the coefficient, the surface, and the angle of attack, and with the square of the velocity. The drift varies with the coefficient and the surface, the square of the angle, and the square of the velocity.

From this we see that to increase the velocity of one wing produces a more than proportional increase in lift, so that lateral control by the use of the rudder only is fairly effective. Its action, of course, is to make one wing travel faster than the other, owing to the machine travelling in a circle. By this method the difference in drift is proportional to the difference in lift. Rudder control is used to a great extent by many of the best flyers of to-day, although their machines are fitted with other lateral control: the reasons for this will be pointed out presently. The disadvantage is that it takes the machine off its course, and thereby complicates the steering.

Variation of the lifting coefficient of the plane has been tried on one or two machines, the usual manner of effecting it being by flaps on the upper surface, near the leading edge, the raising of which causes a surface of discontinuity, thereby diminishing the lift. This control has the advantage that when the lift of the temporarily higher wing is decreased its drift is increased, thus tending to turn the machine towards the upper wing, and to increasing the lift of the lower wing owing to its higher relative speed. It is, however, very inefficient, for the constant effort of the designer is to employ the best possible lifting coefficient, and this control acts entirely by decreasing the lift, instead of by increasing one side and decreasing the other.

Variable Surface Control.

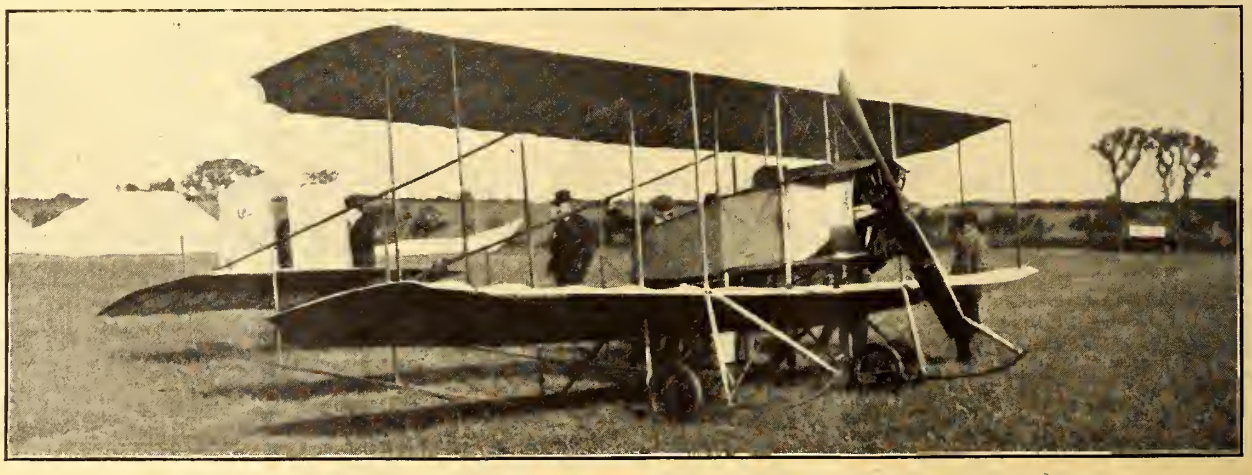
Control by varying surface has been tried now and again. It offers many difficulties in construction, which probably accounts for its limited use. The difference of drift is directly proportional to the difference of lifts, as in the case of rudder control. The variation may be in the actual surface or in the effective surface. The latter method, which is that chiefly used by birds in flight, is applied in the Marçay-Moonen machine, where the wings are pivoted so that they can be swung backwards or forwards. Since the effective lifting surface is governed, not by the actual span, but by the apparent span in front elevation, the lift of a wing may be decreased by swinging it back. The large movement of the centre of pressure produced by this action will need a very powerful tail to correct it, and even then will so upset the equilibrium of the machine that the method appears useless for practical purposes.

Variation of actual surface was tried on the Pfitzner monoplane in America, and was more or less successful. Sliding panels were used, which extended to a variable amount at the tips of the wings. The main disadvantages of the scheme were found to be, firstly, the difficulty of constructing the panels to work sweetly and easily; and, secondly, the impossibility of getting the proper camber in the panels themselves. Various ideas have been mooted for folding wings, none of them, however, practical for hard use. A possible method, which is, at any rate, fairly easy to arrange, is to mount the whole surface of both wings, with their cabanes, so that the entire lifting surface can be bodily shifted to one side or the other.

Variable Angle.

Of all ways of getting variation of lift, alteration of angle is the worst, unless great care is taken in design. This is in consequence of the relation expressed above between lift and drift, from which it is obvious that if lift is varied by alteration of angle, then the difference in drift is greater than the difference of lift. To take a practical example: Suppose that a machine were made in which one could increase the surface of one wing by a third, diminishing that of the other to a corresponding extent. The lift of one wing would then be to the other as 4-3 : 2-3, i.e., one wing would have twice the lift of the other. It would also have twice the drift. But if a similar machine were made to warp until the lift of one plane was double that of the other, the drift of one would be four times that of the other. Similar effects follow on most controls which depend on alteration of angle. The only way to avoid it is to use for control only surfaces which normally run at an angle of zero, in which case the movement of the control causes one to lift and the other to depress to an equal degree, with the result that the drifts remain equal—for drift is not affected by the fact that one plane is lifting and the other depressing: either lift or depression causes the same drift.

There have been many devices adopted to achieve variation in angle. One of the earliest was the use of pivoting wing-tips, used by Blériot on his No. 7, and still in use on the Pivot machine—this is not a pun, but a matter of fact. They form the worst, or possibly second worst, method of achieving the object. First, they add to the span of the machine; secondly, although they are one with the main wing when in their neutral position, directly they are used they become distinct from it, and are then small separate planes, in apteroid aspect, and therefore very inefficient. This means that in order to produce the requisite difference in lift they must be moved through a large angle. This, as noted above, will result in a very great difference in drift between the two sides of the machine, tending to make it turn towards the side already low—an important disadvantage.



The Caudron Biplane, which is now becoming recognised as a "Modest Man's Machine."

Flap Control.

The flaps used on many of the old-fashioned biplanes now in use reproduce almost exactly the disadvantages of pivoting tips. They are very inefficient, not because of low aspect ratio, but because they are flat, and are placed at a sharp angle with the rest of the plane, so setting up large eddies. It is owing to the dangerous drift produced by this type of control that, as noted above, many of our best pilots prefer to use the rudder for lateral control. They find that if one of the wings is depressed, the only effect of pulling down its flaps is to cause the whole machine to turn towards that side, so that during the turn the outer wing, which was already high, gains more lift from its extra speed, and the machine gets beyond control. It is found better, if a wing is depressed, to steer away from it with the rudder, when the outer wing will rise to its proper position.

Warp Control.

The best lateral control in common use is, of course, the warp. This, although it works on the alteration of angle, which is by no means the best method, has the advantage that owing to the large surface affected, the change of angle required is not great, so that the difference of drift is not, at any rate, as bad as that produced by flaps. On the other hand, there are various points in connection with warping to which not enough attention is paid at present.

In every form of lateral control it is important to remember that the effect of the control depends, not only on the actual difference in lift, but also on the distance of the altered lift from the fuselage, for the leverage of the lift is as important as the lift itself.

From this it is obvious that if the wings are tapered, a greater warp must be used to produce the same effect. This means that the difference in drift will be greater, and as this difference must be corrected by the rudder, we see that *if the wings of a machine are tapered towards the tips in plan the machine must have a larger rudder.*

Another point is that if a given amount of warp is used, the effect will be greater as the angle of the whole machine is less. Thus, suppose it possible to warp a wing through 6 deg. on the average, i.e., to add 6 deg. or subtract 6 deg. at the tips, so as to add or subtract an average angle of 3 deg. If the wings of this machine are at 6 deg. at its highest speed in flight, their lifts when fully warped will be as 9 deg. : 3 deg., i.e., one wing will lift three times as much as the other. Suppose, however, that the engine is not pulling well, so that the machine is flying *cabré*, or tail down, and the wings have an angle of 9 deg. In this case, the wings when fully warped will lift respectively as 12 deg. : 6 deg., i.e., one wing will only lift twice as much as the other. This is a well-known effect in practice. I have heard a pilot say after a flight: "Her tail was so low that she wouldn't answer her controls."

Balancing Planes.

The other important method of altering angle is by the use of balancers, or ailerons. These may be either surfaces entirely distinct from the main planes, as used by Cody and Curtiss, preferably self-cambering, as used in *Viking I.*, of the A.S.L., or non-lifting backward extensions at the plane-tips, as used in the Etrich and Albatros machines. The disadvantage of these balancing surfaces is the great sensitiveness as regards setting. If they are set so that when they are symmetrical they are neither lifting nor depressing, then, as explained above, their action imposes no difference in drift, and their use need not involve rudder correction. But if, owing to stretch of control wires, etc., they both give a slight lift or depression when in neutral position, this no longer holds. If they both lift when neutral, then their use to correct a sideways tilt will make the machine turn towards the depressed wing. If, on the contrary, they both depress, their use will swing the machine away from the depressed wing.

Taking it all round, then, it would seem that the best possible lateral control is that provided by the use of self-cambering balancing planes in a biplane (*Viking I.*) or flexing extensions in a monoplane (Etrich). These should be set so that in normal flight they have a slight depressing action, so that if the connecting wires stretch, the steering will not be greatly upset.

An Important Alteration at the War Office.

Those who tax the War Office with lack of interest in aviation will be interested to hear that their reproaches are no longer justified, and that questions relating to the *personnel* of the Air Battalion are now dealt with by the Adjutant-General's Department, the particular sub-department being M.T. 2 (Military Training), so that applications for attachment to the battalion or for appointment to the permanent establishment will no longer be handled by the Director of Electric Lights in the department of the Master-General of Ordnance. Any change would seem to be a promise of improvement, but at present the officials of M.T. 2 do not seem to have any very definite ideas as to the possibility of attaching to the Air Battalion those officers who have already got their certificates at their own expense. So far as *materiel* is concerned, one gathers that the machines themselves and their equipment will still be officially considered as pertaining to the electric lighting plant.

Handbills over Paris.

In 1910 Parisot, accompanied by a passenger, flew from Issy les Moulineaux on a Farman, intending to make a sensational landing in the Place de la Concorde. Entirely losing his way in the early morning fog, he made a forced landing in the Place des Invalides, and in avoiding a perambulating milk cart, collided violently with a lamp-post, which he entirely demolished. His machine was wrecked. M. Lepine, the chief of the Parisian police, at once issued an edict forbidding aviators to fly over Paris under heavy penalties, to take effect, it seemed, in the event of accidents.

The first actually to be summoned under the edict is M. Védrines, who, on the afternoon of the 20th, flew over the Chamber of Deputies and distributed some hundreds of small handbills inscribed with the words: "Let France have the aeroplanes she needs."

An agitation is at present being made in favour of spending 100,000,000 fr. on military aviation during 1912, and this was the method adopted by M. Védrines to enforce his views on the country's legislators. One would hardly imagine such a demonstration favourably impressing a parliament. As a lesson to the young and ardent anarchist searching for new and horrible methods of distributing death amongst politicians this effort is no doubt admirable, but it will hardly receive the more support because of that.

Flying over towns cannot be too greatly deprecated in the true interests of aviation, and one can only hope that M. Védrines will be heavily fined, the more so as he is an aviator of the first rank and ought to know better.

In London, however, the Houses of Parliament are conveniently situated alongside the river, so there is no need to fly over the city itself when it is desired to give an aerial demonstration to the members.

Congratulations.

Congratulations to Commander Samson, R.N., who has just received his step. As a senior lieutenant he started work at Eastchurch, and quickly showed himself to be an aviator of more than usual ability. Last year he put up a very fine duration flight, which beat the existing British record, and only a week or so ago he distinguished himself further by being the first British aviator to fly off a ship.

Captain Gerrard, R.M.L.I., who broke the world's passenger duration record, has also received his step since he started to fly at Eastchurch, and though these promotions have not been made for aviation services, as is the custom in France, it is none the less satisfactory to know that our naval aviators have not been put in a corner and forgotten, as so often happens in the British Services.

Another recent promotion is that of Captain Watkins, of the 3rd Batt. Essex Regiment, who has got his company since his return from Australia.

The Royal Aero Club.

At the committee meeting on Tuesday, the 16th inst., Lieut. H. E. Watkins was elected a member.

The following aviators' certificates were granted: 173. Tom Garne (Bristol, Brooklands); 174. Lieut. Napier John Gill, R.G.A. (Deperdussin, Brooklands); 175. Frederick Bernard Fowler (Blériot), Eastbourne). The request of the Aero Club de France to grant an aviator's certificate to Mr. D. Corbett-Wilson was sanctioned.

THE ANNUAL GENERAL MEETING will be held on Thursday, March 28th, 1912.

Notices of motion for the general meeting must be received by the secretary not less than twenty-one days before the meeting, and must be signed by at least five members.

Mr. E. T. Willows has kindly presented to the club a framed enlargement of his dirigible balloon "E. T. Willows No. 3."
—HAROLD E. PERRIN (Sec.).

The Week's Work.

Monday, January 15th.

Brooklands.—Kemp on Vickers out in half-gale, and did some exciting flying. Ducrocq managed two and a-half circuits. Pizey took Lane and Nesham for straight flights on Bristol for landing practice, but too windy for circuits.

Hendon.—Capt. Loraine joined Ewen School to learn Blériot and Deperdussin. Soon got control and did straight flights. Warren, Dubois, and Baumann also doing straights.

Tuesday, January 16th.

Brooklands.—Wind and rain. Flying impossible.

Wednesday, January 17th.

Brooklands.—Percival early did a circuit, but weather too bad later for anyone to go out.

Huntingdon.—W. B. R. Moorhouse out on R. and M. monoplane just bought by Mr. Tom Garne. Did several impressive circuits in very gusty wind, and chased a number of seagulls off flooded portions of Portholme, but not up long.

The Plain (Air Battalion).—Lieut. Barrington-Kennett out for short time in morning.

Brighton-Shoreham.—Lieut. Walter Lawrence expects delivery of Blackburn monoplane here, so should report good flying by this officer next week. Collyer-England biplane proved worthy of more powerful engine. A 35 Green is therefore being installed. Machine will probably be out again by time this appears in print. M. Chanter and Co.'s staff busy getting Blériots into flying order again.

Eastchurch.—Lieut. Samson, R.N., and Capt. Gerrard, R.M.L.I., flew new Short tandem machine and found her to have excellent controllability. Capt. Gerrard, who took her up to 700 ft. with a passenger, says she climbs remarkably well.

Thursday, January 18th.

Brooklands.—Pizey did one test flight on Bristol, but weather hopeless.

The Plain (Air Battalion).—Snow started on Wednesday night and continued on Thursday, but plenty of flying. Capt. Fulton and Lieuts. Conner, Reynolds, Barrington-Kennett and Fox all out for varying periods.

The Plain.—Baron Cederström, first Swedish pilot, visited Bristol School. Wind blowing 15 m.p.h. and blinding snow, and Baron sceptical as to any machine flying, but Jullerot, to use own term, "took on the bet," made successful flight and came down with "eyes full of snow and soul full of triumph." At midday wind dropped and snow stopped, so Lieuts. Ashton and Murray and Mr. Bendall did solos. Later Jullerot took Baron Cederström as passenger in No. 66, doing right and left turn and "switchbacks." Baron thought machine stable and easy to control. Harrison made one flight, after which more snow.

Friday, January 19th.

Brooklands.—*Parseval I.* out rolling with pupils, Miss Percival showing excellent ability, her brother sitting behind giving instruction. Cannon—brother of Mornington and Kempton Cannon—joined school and also had rolling practice. Pizey did one circuit on Bristol with Lane as passenger, but too windy and wet for more. Landed near flood area and rolled into 3 ft. of water. Very wet pilot and passenger hung up to dry in *Blue Bird.*

Huntingdon.—Serious accident to Mr. Tom Garne, who might easily have been killed. Went up in gusty weather on very fast 50 h.p. R. and M. monoplane just bought from Mr. Morison. Did four circuits in good style. Then, at 150 ft., hit by gust which tilted machine to right, and side-slipped. Apparently dived machine to correct, but seemed to rudder to right at same time, thus making sharp spiral to right, left wing going higher and higher, and turn getting smaller and smaller. Finally hit ground nose on, smashing everything in machine, including engine, excepting only tail and rudder. Mr. Garne fortunately escaped with bad shaking and cut face. Complete recovery cordially wished by all, but greater care and more experience strongly advised before flying really fast machine.

The Plain (Air Battalion).—Another beautiful flying day. Capt. Fulton testing Lieut. Manisty's machine, afterwards handing over to him, who put in good flights. Lieuts. Conner, Barrington-Kennett, and Fox out on respective machines. In afternoon wind sprung up, and Lieut. Fox, who attempted tests for brevêt, was blown down after completing four figures of eight. Lieut. Barrington-Kennett later went out on biplane and flew for forty minutes at 1,800 ft., finishing with spiral glide.

Hendon.—The weather improved, but foggy. Fowler out on Grahame-White School biplane No. 3, and put in fifteen minutes at good straights, after which he changed to biplane No. 1 and made five circuits at about 120 ft., landing in fine style. Monoplane No. 4, which has just been fitted with 25 h.p. Anzani for school work, also out in hands of engineers for test, engine running well and pulling 190 lbs.

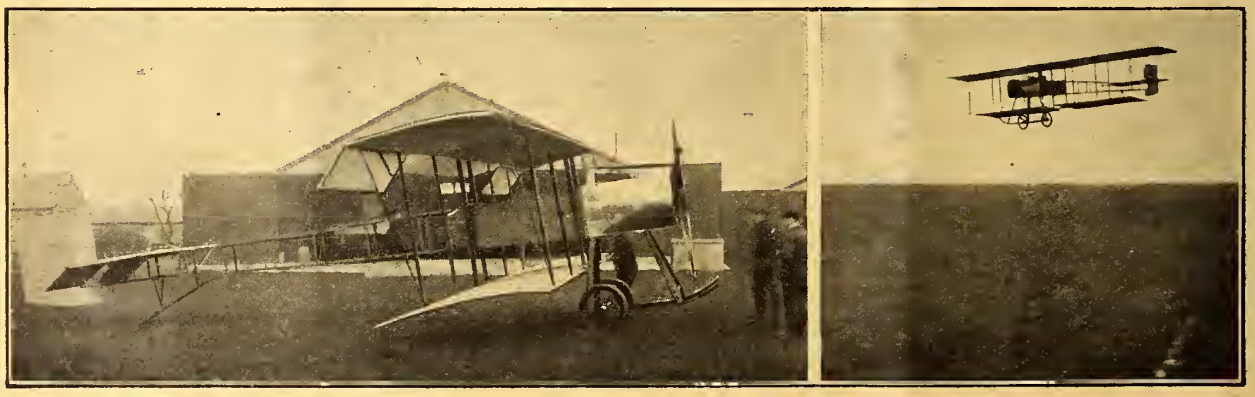
At Blériot School, during short interlude of reasonable weather, M. Pothet and Mr. Clappen did good straight lines and showed good progress. M. Desoutter made circuit of aerodrome, and is impatiently awaiting fine day to take his brevêt, as are also Messrs. Parr, Allen, Prenssiel, and Welburn, who are quite ready. Rest of week weather was too bad for any outside work.

Saturday, January 20th.

Brooklands.—Best day of very bad week. *Parseval I.* shed a wheel on starting, so landed on axle-end and spun round, breaking skid strut and twisting fuselage. Good test of soundness of machine.

At Vickers School E. V. B. Fisher and Lieut. Beatty, R.E., doing straights in fog, and getting lost at intervals. In afternoon new all-British Vickers appeared to tune up engine. Fine piece of work with very original idea in wings. Enormously thick entering edge which depresses slightly as trailing edge rises, and *vice versa.* Fuselage oblong in section deep and narrow.

Pizey up in morning with Lieuts. Beatty and Smith. In afternoon doing clever flying in nasty puffy wind with Ronald Charteris as passenger, latter insisting on sharp turns and eccentric dives at unexpected places. Later T. O. M. Sopwith took up same Bristol for trial, with Charteris again as passenger, and did still more quaint flying, with some quite unusual right-hand spirals. Remarked on descent that



The new Short tractor biplane. On the right the machine is shown flying with Mr. Frank McClean as pilot. Note the planes staggered backwards, the high centre of gravity, and the rudder without fin.

machine handled extraordinarily easily, and was great improvement on most biplanes. Lieut. Smith out "rolling," idea of same being series of strange bounds into air with fondness for descents in large pools of water. Aquatic display excellent. Pizey also up with Lane for circuits.

At Deperdussin School, Sabelli out on taxi doing straights. Mr. Gill, brother of newly certificated gunner pilot, joined school. Evidence of satisfaction of previous pupil. Thanks to bad weather, all four Deperdussins now in thorough repair. so plenty of machines for pupils to work on.

Spencer out on own biplane flying extremely well. Hunter, of Dewsbury, flying straights on Jack Humphreys' quaint monoplane. Tail still seems to be attracted by gravity, but machine certainly keeps off ground for extended periods.

Flanders monoplane, looking handsomer than ever with new wings and minor alterations, now ready for test as soon as engine properly tuned. Pashley Bros.' Humber also nearly ready for work again.

Mr. Sopwith's four machines expected daily, and will probably open school with them. Four distinct types: Old Howard Wright "family tank," Burgess-Wright biplane, Howard Wright monoplane, and 70 h.p. Blériot tandem two-seater, so plenty of variety for pupils to learn on. Will probably have Anzani-Blériot as taxi also, and will fit dual control to both biplanes for school purposes. Should make excellent school, with Sopwith's experience of flying and Mr. Sigrist's unsurpassed ability in tuning engines and keeping planes in order.

Eastchurch.—Company of Territorials in charge of Lieut. Cockerell and Lieut. Barrington-Kennett down for day. Mr. Maurice Bidder, Captain of Territorial Balloon Company, also down. Some good flying was done by Lieuts. Cockerell and Barrington-Kennett. Lieut. Gregory, R.N., and Capt. Gerrard, R.M.L.I., instructing naval pupils. Mr. Alec Ogilvie also out several hours on Wright biplane.

Sunday, January 21st.

Brooklands.—Capt. H. F. Wood out on *Vickers III.*, the new machine with original wings. Obviously very fast, and gets off ground quickly. Fog too thick for circuits, but seems to handle well. Later, Maurice Ducrocq, on biplane, also out in fog, as well as Hunter on *Umslopogaas*.

Pizey up with Mr. Roe as passenger, who was charmed with his experience. Also out with Capt. Weeding (now back from Switzerland), Lieut. Smith, and Merrian. Later up alone, performing weird evolutions in dense fog. He avers solemnly that the fog was so viscous that he distinctly saw a *remou* in it, and was able to stabilise by sight instead of by feeling.

Hendon.—At A.S.L. School, in spite of thick fog, Mr. Barber brought out new Valkyrie monoplane in afternoon. Several circuits accomplished, though fog made altitude impossible. New machine came out with usual excellent finish characteristic of A.S.L. workmanship, and is very much lighter than its forerunners. It also differs from previous practice in having warping wings set at slightly less dihedral. At Ewen School four or five hours' work. Lawford doing straights. Warren straights at 50 ft., with right and left turns. Baumann and Dubois also out. W. H. Ewen on Deperdussin up at 300 ft. in fog, doing sharply banked turns.

Eastchurch.—Lieut. Barrington-Kennett, qualifying for his pilot's certificate, completed first half in splendid style, and only slight engine trouble and approaching darkness prevented him from completing both tests. During day those Territorials who had not previously had experience of flying were taken up by Lieut. Cockerell and Mr. J. L. Travers.

Another Pilot for Hendon.

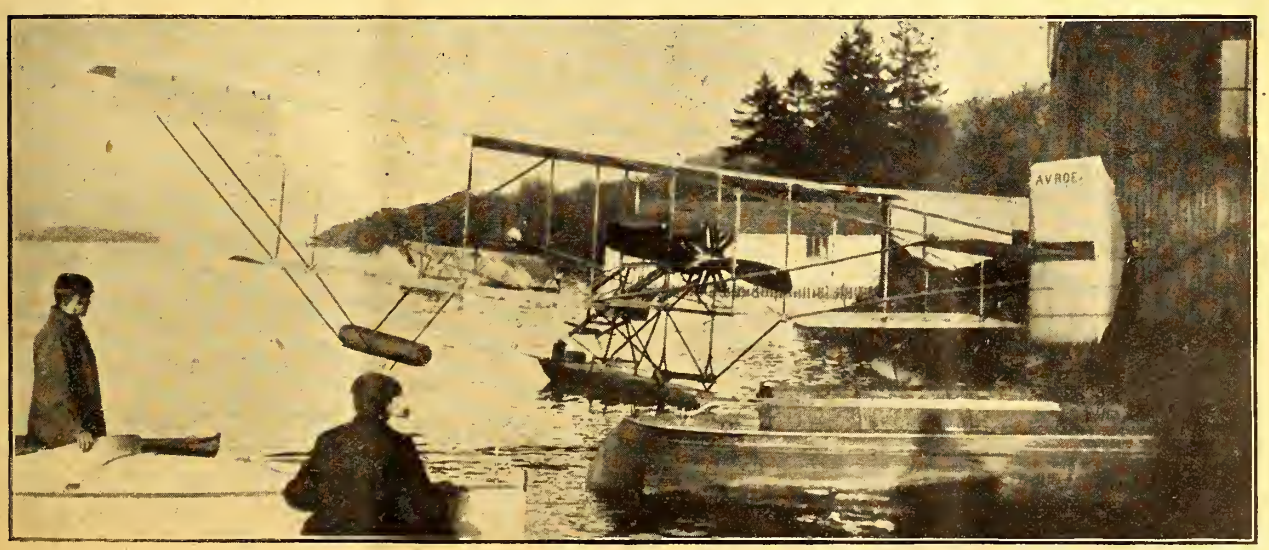
Mr. Lewis Turner, who was the first British pilot to pass the new certificate tests last year, has now returned from Russia, and has joined the Grahame-White Aviation Company, Limited, as pilot-instructor. He started on his new duties on Monday, and, though prevented from flying by the weather, put in much instruction work in the sheds. The appointment is a good one, for Mr. Turner is a capable mechanical engineer as well as merely a flyer, and he should prove a valuable addition to the school.

A New Irish Aviator.

At last an Irishman domiciled in Ireland has got an aviator's certificate, though even he went to France to get it. Mr. D. Corbett-Wilson, of Kilkenny, has won his certificate at the Blériot School at Pau, and gives promise of being a very good flyer. His debût was not encouraging, for he started at Hendon by breaking two machines in a week, incidentally breaking a record of a couple of months without a smash by any pupil at that school. After that he went to the school at Pau, and did really well. Mr. Corbett-Wilson is a well-known hunting man in the Kilkenny, Carlow and Island, and Waterford countries, and is just the sort of recruit aviation needs. He will probably be the first Irishman with a certificate to fly regularly in Ireland, for though Mr. Moore-Brabazon holds an aviator's certificate he does not now fly, and, in any case, can scarcely be called a domiciled Irishman, whereas Mr. Ferguson, though he flies in Ireland, is not a certificated aviator.

An Aeroplane Tug.

Eastchurch was treated to a novelty on the 13th, Mr. Leo Jezzi towing into its shed the new Brocklehurst monoplane, which, owing to some slight mishap, had become stranded on the ground. The towing was done at quite a respectable speed, Mr. Jezzi, who generally does about 60 m.p.h. on his little biplane, doing some 25 m.p.h. during the towing. Mr. Fowler, who, by the way, is largely responsible for the designing of the landing chassis of the Brocklehurst monoplane, has put some sound work into the machine. The wings are something after the Etrich style, having been designed by Major Brocklehurst to give automatic stability.



Photograph by Herbert and Son.

A nearer view of the "Water-Bird," on Windermere, showing the arrangement of the floats.

Some Notes on the Gnôme Engine.

Various readers of The Aeroplane have from time to time asked for a simple description of the working parts of the Gnôme engine. As may have been gathered, the writer is no particular admirer of rotary engines of any kind, and firmly believes that ere long rotary engines will die a natural death. Nevertheless, the Gnôme engine has done much to advance the practice of aviation, even if it has at times confused the theory, and it is only fair, therefore, that the engine's operating principles should be placed on record in a simple form for future reference.

The following description is based on that given in that useful book, "The Art of Aviation," by Mr. R. W. A. Brewer, and the illustrations are reproduced from it by the kind permission of Messrs. Crosby, Lockwood and Co. The description, of course, refers to the ordinary 50 h.p. engine.

This has chrome-nickel steel cylinders machined, ribs and all, out of solid blocks of metal (Fig. 1). Each side of the crank chamber is made of a steel disc, and these are fixed on two dowel pins placed between the cylinders in a big ring arrangement, which is shown in Fig. 2. The cylinders fit

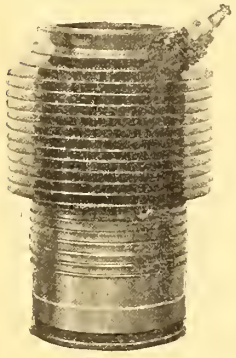


Fig. 1.

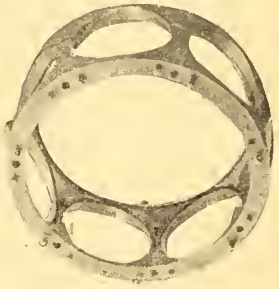


Fig. 2.

into the circular holes and are secured by steel rings fitting into grooves, these rings being held in place by the seven long bolts which hold the end plates of the crank chamber in position, one of these bolts being between each pair of cylinders. The seven connecting rods work on a single crank-pin on a stationary crank-shaft (Fig. 3).

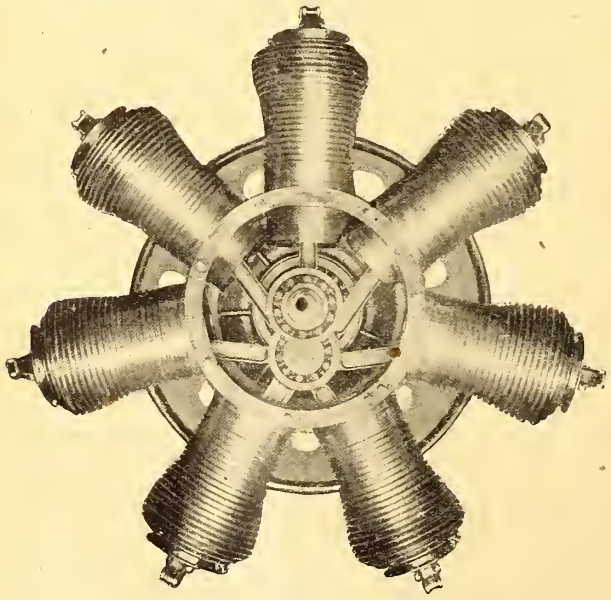


Fig. 3.

Mr. Brewer, in writing of this engine, remarks that the rotation of the cylinders causes the air to impinge on the leading side of the cylinders only, so that the trailing side of the walls is surrounded by eddies of warmer air. This tends to distort the cylinder bore from its true form when hot, so that special provision must be made for keeping a tight piston joint. Ordinary rings would be too stiff for this purpose, so a flexible joint has to be made similar in action to the cup leather of an ordinary tyre pump, the said cup being made of a light ring of L section brass. The ring is split, and makes a close joint where the ends butt, and is used simply as a jointing material. Inside this brass cup is an ordinary cast-iron piston ring, fitting in a wide groove in the steel piston. The piston itself is a fairly loose fit in the cylinder, so as to eliminate risks of seizing.

Fig. 4.

The arrangement of the connecting rods is thus: One rod has a large double disc end (Fig. 4) forming the outer race of a ball bearing running on the crank-pin. At intervals of 51½ deg. around these discs six attachment pins are held, thus dividing the points of attachment into seven equal angular intervals. The remaining six connecting rods are attached to pins at these points, and naturally their obliquity in course of revolution will be greater than that of a rigidly connected rod.

The carburettor feeds the engine through the hollow crank-shaft (Fig. 5) into the crank chamber, and each cylinder draws its mixture through an automatic valve situated in the middle of the piston head (Fig. 6). To overcome the centrifugal force

Fig. 6.

acting on these valves two counter weights are fitted, which keeps the valve on its seating at high speeds in such a way that, whatever the force acting upon the valve may be, an equal force acts upon the valve stem through the counter weight, and these are assisted by two small plate springs, which are the chief source of trouble in the engine.

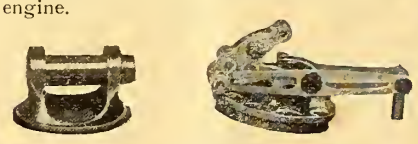


Fig. 7.

The exhaust valves are situated in the cylinder head, and are operated by twin-balanced rocking levers, which are also counter weighted so as to relieve the cams of undue stresses owing to centrifugal force acting upon the valves (Fig. 7).

Lubrication is by means of a reciprocating pump forcing oil through the cam shaft into the main bearing, whence, owing to centrifugal force, it is discharged in enormous quantities into the cylinders through the inlet valves and out through the exhaust valves.

Fig. 5.

The drawbacks to the engine include its gyroscopic effect owing to its being a rotary engine, the fact that when an inlet valve spring goes wrong the next explosion is liable to fire back into the crank-case and ignite the gas there, and the further fact that the oil, owing to centrifugal force and the fact that the valves are in the pistons, is thrown out in a most wasteful manner. There are others also.

The success of the engine is due to the fact that it is even now the lightest engine per horse power on the market, judging it on its rating by cylinder capacity.

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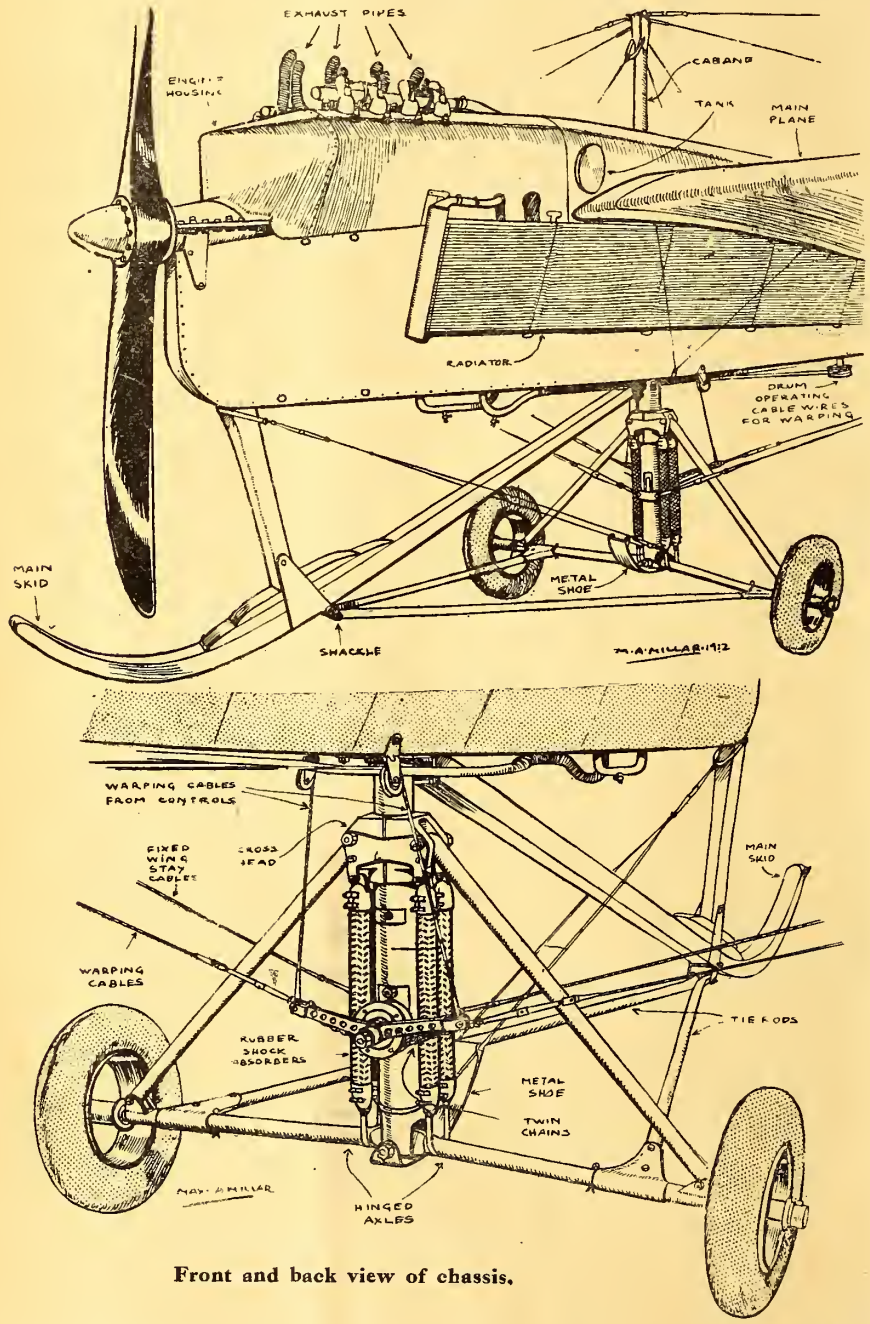
Some Details of the Martin-Handasyde Monoplane.

The accompanying drawings of the chassis arrangement of the Martin-Handasyde monoplane will doubtless be of interest to the numerous readers of The Aeroplane who have seen the machine flying, but have not had an opportunity of inspecting it at close quarters.

As may have been gathered from notes in this paper, the Martin-Handasyde is regarded to-day as one of the most magnificent machines in the world, and certainly, so far as actual workmanship is concerned, it would be hard to find anything equal to her. The machine is, of course, in a general way built very much on Antoinette lines, and does not pretend to be anything else, but the internal work in the machine is far superior to anything ever turned out even by that excellent firm. The wing camber, however, is entirely different, which probably accounts for the machine being very much faster than any Antoinette, and the careful streamline housing of the engine also adds considerably to the speed.

The chassis, while very much of the Antoinette type, is operated on an entirely different principle, for in the Antoinette the spring is entirely oleo-pneumatic, whereas in the Martin-Handasyde it is worked on rubber suspension.



Front and back view of chassis.

Mr. Millar's drawings are practically self-explanatory. It may be necessary, however, to point out that in the illustration of the controls the wheel is used for warping, and operates a bevel gear in the spherical top, which revolves an internal shaft to a drum, which in turn operates the warping wires. Both the rocking lever of the warp, the vertical shaft, and the bevels themselves are mounted on ball bearings, with the result that the control is, of anything, too sensitive.

Mr. Graham Gilmour, who has done some excellent flying on the machine, told the writer only last week that the warp is practically automatic, the result being that when one wing is struck by a gust the trailing edge jumps up so quickly that it almost pulls the wheel out of the pilot's hands before he has got time to follow it round and increase the warp. In fact, he says that he himself never uses the warp except to warp one side up on purpose when turning corners, for the machine absolutely stabilises itself, as, of course, every well-designed machine should do.

The landing chassis has been found quite effective, and Mr. Sopwith's recent slight accident at St. Albans was not through any fault of the chassis, because while taxi-ing along the ground after landing the whole chassis dropped bodily into a hole about 3 ft. deep, which was hidden by grass, the top of which was level with the rest of the field, and, of course, any machine would be bound to crumple something under those circumstances. As it was, the tip of the skid took the shock, and the skid broke close up to the body, thus actually saving the machine itself from any damage, and merely breaking the propeller.

Messrs. Martin and Handasyde are of the opinion that for the military competitions, where the machine will have to land in a ploughed field, a somewhat different type of chassis will be needed, but the general lines of the machine are considered quite good enough to pass practically every condition demanded.

A NEW WORLD'S RECORD.

On Saturday, the 20th inst., at the Vidamée Aerodrome, Verrept, on a 70 h.p. Borel monoplane, accompanied by two passengers, MM. Voigt and Lina, rose to a height of 1,075 metres, thus breaking the world's height record with two passengers. He took eighteen minutes to reach the height attained, and only the intense cold prevented his rising farther. The total weight lifted, that is of pilot, passengers, petrol, and oil, amounted in all to 300 kilos.

A Greeting from South Africa.

From that ever-cheerful pilot, Mr. C. Compton Paterson, comes the postcard reproduced herewith. The greeting on the back reads :—

"December 24th, 1911.

"The 'Old Firm' have started. Cheer up and keep warm. Kindest regards and Best Wishes for a Happy and Prosperous New Year. Bung out some copies of the dear old Aeroplane. We ain't seen it since we began to 'boil.'—(Signed) C. Compton Paterson."

The day before sending the above cheery message Mr. Compton-Paterson had been up to 2,000 feet, the greatest height reached in South Africa, and on Christmas morning he again went up to 2,000 feet, flying from Kenilworth to Green Point, but on the 26th he had a nasty fall, the biplane turning over owing to a strong gust hitting it while rising out of the track. Fortunately, Paterson was only badly shaken.

Notes on the Army Aircraft Factory Biplane.

It is now possible to give some further particulars of the Army Aircraft Factory's biplane, which has obtained so much valuable free advertisement in the daily Press. Some readers of The Aeroplane may think that, because this paper has chaffed the machine and its producers over the excellent way in which the machine has been advertised, the staff is under the impression that the machine itself is no good.

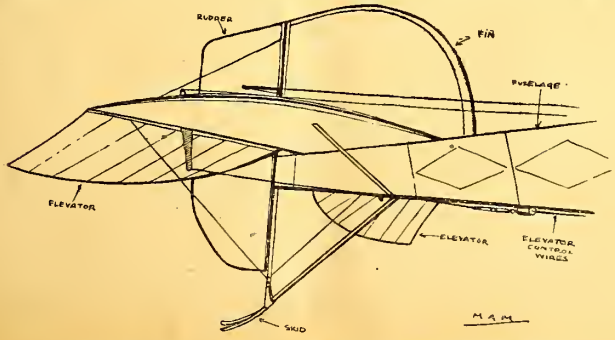
As a matter of fact, knowing the class of work done by the very capable working staff of the Factory, there has never been any doubt as to the quality of the workmanship and material, for one has only to look at the Air Battalion machines which are repaired at the Factory to realise that the actual mechanical ability of the workmen there is of the best. To tell the truth, the machine is really quite well made, and is one of the strongest in the country.

It is, however, on the points which have been so much boomed by the Press that accurate information will no doubt be most acceptable. A good deal has been written on the subject of the so-called automatic warp. As a matter of fact, the warp in question is only as are all other warps. That is to say, if a gust strikes a wing, that wing goes up and throws the lever over so that all the pilot has to do is to help the lever a bit further. Naturally, to anyone who is used to flying with the old-fashioned flaps, such action would appear almost automatic, but, actually, it is no more so than the action of any other modern machine.

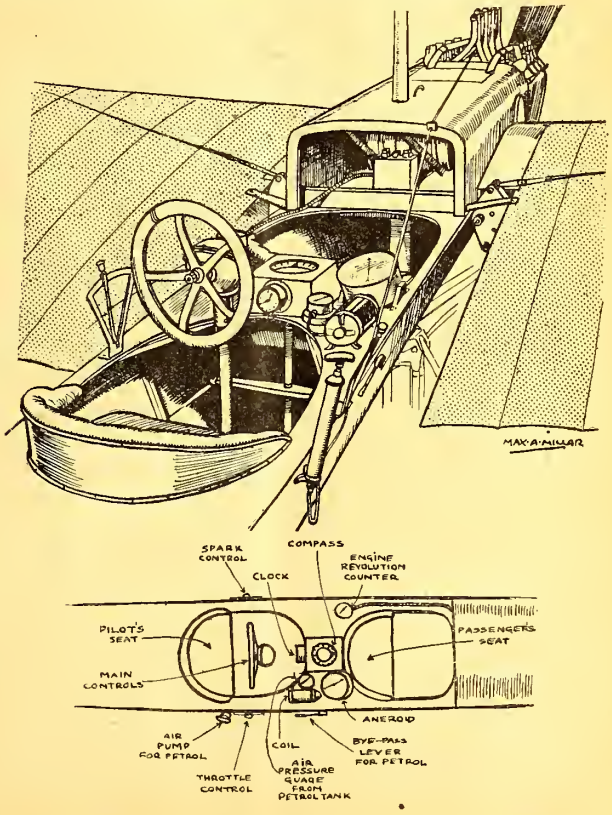
Another point which seemed to surprise the daily Press very much was that the pilot could start the machine himself. The fact is that the engine has to be started in the usual manner by swinging the propeller, but it so happens that the Wolseley engine can be throttled down so that it will start with the throttle nearly closed, and thus the pilot can swing the propeller himself and leave the engine running without the machine starting. The ability to do this depends, of course, on having the carburation perfect, and it is more than probable that if through any unforeseen alteration in the carburation, or a slip of the adjustment of the throttle, the engine started at a higher speed than usual, the pilot, after starting up, would have to run for his life pursued by an infuriated propeller. This method of starting is exceedingly dangerous, unless the machine is anchored in some way, as suggested in the article on the War Office competitions last week.

It has also been said that the machine was built out of an old Voisin. Actually no old material was used at all, with the sole exception of the engine. The silencer now fitted is quite effectual, and apparently does not reduce the horse-power or speed in any way, but, as has already been pointed out, this is not in any way a new departure.

Something of a feature has also been made of the fact that there are no stay wires to the tail or elevator. This, of course, is a distinct advantage, but is not novel, as the same absence of wires is noticeable on the Vickers and other machines. In the Army machine the controlling planes in question, which are built of acetylene-welded tubes, are said to be quite strong enough without stays. The writer, how-



The empennage and controls of the Martin-Handasyde.



The seating accommodation of the Martin-Handasyde.

ever, is by no means convinced of this fact, as acetylene-welded joints are apt to be very treacherous, especially when used with very light gauge tubing, because the action of the welding is apt to burn the tube, and, further, the actual welded joint itself must of necessity partake more of the nature of cast iron than of steel, owing to its passing through a liquid or semi-liquid stage in order to weld as it does. Unless the regulations have been altered quite recently, acetylene welding of any kind is absolutely barred in naval work, as the result of a series of exhaustive tests of acetylene-welded joints made a few years ago. In the writer's experience, brazed joints are immensely preferable.

One point about the machine which is, at any rate, unusual, if not actually original, is the orientable rear skid, which is connected with the rudder control. With its help the machine can manœuvre on the ground as easily as a bicycle, and Mr. de Havilland, the pilot, seems to thread his way in and out of the trees on Farnborough Common with the greatest ease. The obvious objection, however, is that in a fuselage tapered so much as that on this particular machine the twisting strain of the skid on the ground seems very likely to strain the bracing wires inside the fuselage, and so make the whole machine dangerous unless these wires are very carefully trued up at intervals.

It appears that the whistling of the radiators has now been stopped by fitting Spiral Tube radiators, and that the only noise now made is due to the propeller and the stay wires on the main planes.

In a general way the machine is of the Bréguet and Avro type, but the distribution of weight is different; the planes are more like those of a Wright, and the tail is a kind of cross between the Flanders and Nieuport. The machine weighs about 200 lbs. less than the Bréguet, but there are, of course, considerably more stay wires. A sensible feature is that every wire actually lifting the machine is doubled as a safeguard against accident.

THE "WATER-BIRD" ON WINDERMERE.

In view of the intense interest which is now being taken in hydro-aeroplanes, some particulars of the "Water-Bird," as the machine owned by the Lakes Flying Company at Windermere is called, will doubtless be useful.

Strangely enough, public interest in this type of machine has been considerably increased by the very people who are most opposed to it, namely, those who have been conducting a violent attack on this particular machine in various London daily papers on the futile plea that its presence on Windermere is defiling the beautiful Lake District It is, of course, a strange type of mind which objects to the most graceful of all locomotive vehicles, while, not only tolerating, but even encouraging, smoky boat loads of jabbering tourists to invade their pet beauty spot. However, a good enemy is always the best possible advertisement, and doubtless the Lakes Flying Company are duly grateful to their opponents.

The "Water-Bird" is primarily a biplane of the Curtiss type, built by A. V. Roe and Co., and fitted with floats by the Lakes Flying Company. Mr. E. W. Wakefield, the Director of the company, informs The Aeroplane that the machine made its first successful flight from the water and on to the water on November 25th last, which was eight or nine days after his friend, Commander Schwann, rose from the water at Barrow on his Avro, but nearly five months after Mr. Oscar Gnosspelius, who is designer and engineer to the Lakes Flying Company, first left the water in a machine of his own construction altogether different from the present machine. But this first machine has not yet done anything more than long hops.

The arrangement of the successful machine is the result of some twenty months' experimenting on Mr. Wakefield's part. It has been very considerably altered and adjusted since it was first built, the elevator control, rudder, tail, ailerons, and extensions all having been altered in one way or another.

During the past two months, in spite of bad weather, it has made about sixty flights on thirty-eight days. Its greatest distance has been about twenty miles, and its best height 800 feet.

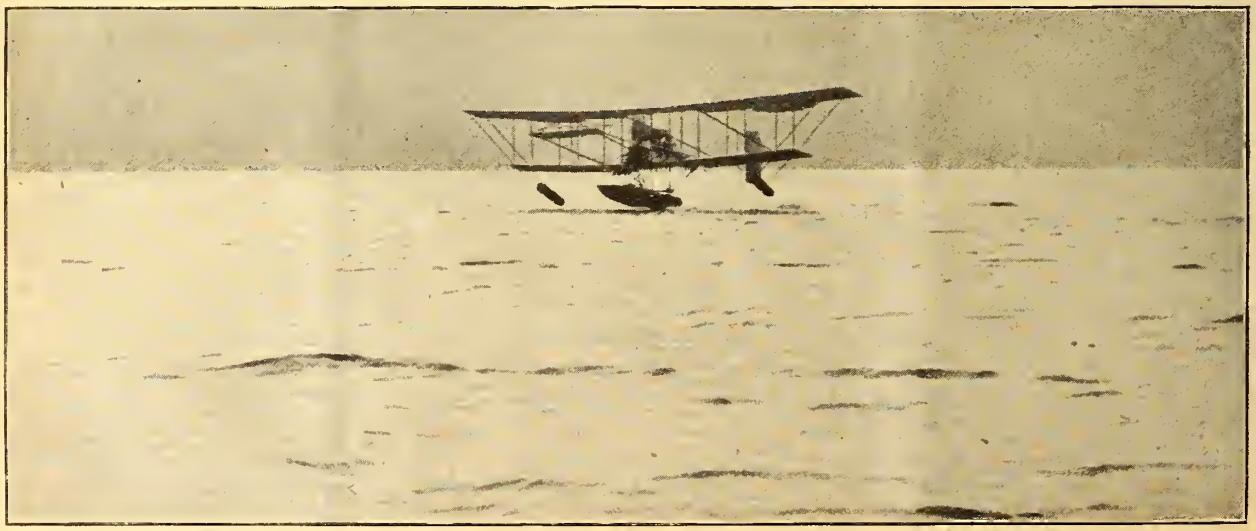
The main float is a three-step hydroplane 12 ft. long, 2 ft. wide, with an average depth of 1 ft., and is slung to the chassis by rubber suspensions, which take the shock on striking the water. In addition, cylindrical floats are placed under each wing tip to support the wings when she rolls.

As may be seen in the photographs, taken by Messrs. Herbert and Son, of Bowness, which appear in this issue, the machine leaves the water, and strikes it again, with suprisingly little disturbance, and altogether the machine may be regarded as extremely successful. There is, of course, the objection to it that the engine is at the back, so that if it did happen to come down very much nose on, and turn over, the pilot would have to extricate himself from the various wires and struts before he could get clear. However, Mr. Wakefield says that he realises that there is a good deal in this objection, and it is his firm's intention to try experiments with the engine in front.

This machine is undoubtedly the first really successful hydroplane in the country, and Mr. Wakefield and the manager of the company, Mr. Stanley Adams, deserve very great credit for the work they have done. It is interesting to note that the Earl of Lonsdale, one of the greatest sportsmen in the country, is the patron of the company.

An Interesting Addition.

The latest celebrity to take service with the British and Colonial Aeroplane Company is M. Coanda, who is certainly one of the most original minds at present connected with aviation. M. Coanda will be the chief of the "technical department" at the Bristol works, and there he will, with the assistance of a few skilled workmen, carry out experiments with new inventions which are submitted to the firm, and with his own undoubtedly brilliant ideas. The scheme is an excellent one, for it will leave the works proper, which are under Mr. Raper's very able care, undisturbed by anything which can upset regular routine work; for nothing is so upsetting as having odd jobs thrust into a workshop which is organised for really efficient repetition work.



Photograph by Herbert and Son.

The "Water-Bird," with Mr. Stanley Adams as pilot, just leaving the surface of Windermere.

Correspondence.

The Editor of THE AEROPLANE *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* THE AEROPLANE, 166, *Piccadilly, W.*

The Prevention of Accidents.

Sir,—I have read with great interest your article on the "Prevention of Future Accidents," and the various letters from your correspondents, Mr. Manning, Mr. Roe, etc., and I quite agree that the time has come when some provision should be made to prevent any firm engaged in the manufacture of aeroplanes from turning out machines which are practically death-traps to the aviators who use them. But I do not quite agree with the proposal to form a committee to inspect the manufacture of same. It would be a very expensive matter for a committee to travel about from place to place to inspect machines which are in course of construction in the works of various firms, and in the end perhaps only see half of them.

I think the better method to adopt would be to compile a list of rules or by-laws of construction to be strictly adhered to, these by-laws to contain the minimum strength of spars for certain spans and strength of struts of a certain length, also skids, etc., similar to the by-laws at present used by the building surveyors of the various boroughs and towns.

The manufacturer to deposit drawings with the Royal Aero Club of the aeroplane proposed to be built, fully dimensioned, and containing all information required under the said by-laws.

The Royal Aero Club to appoint an inspector to occasionally visit the works of the different firms, and even the flying grounds at which aeroplanes are in use, and make an inspection of the machines in course of construction, and, in the latter case, new machines in use.

Sir, you will most likely agree with me that the above scheme would be easily worked, and would not embody the finding of so many suitable men to form a committee.

Birkdale. THOMAS FINNEY-PEARSON.
(Draughtsman and Designer.)

Design for Transatlantic Machines.

Sir,—I was very interested in your article on the above by Mr. P. K. Turner, the conclusion of which would appear to indicate that given the best possible conditions and efficiencies such a machine lies within the bounds of present practice.

Mr. Turner seems, however, to have neglected one very important consideration in his calculations, viz., the efficiency of the propeller.

If we agree to the assumptions made in the article (and these seem perfectly reasonable), and also make the further one that the efficiency of propulsion remains constant during the flight, we arrive at the following expression :—

$$f = w\left(e^{\frac{a\,b\,l}{375\,p}} - 1\right)$$

Where, as before—

f = weight of fuel in lbs.
w = weight of machine, engine, pilots, etc.
a = gliding angle in radians.
b = lbs. of fuel per h.p. hour
l = length of flight in miles.
e = 2.7183,

and, in addition, p = efficiency of propulsion. This will be seen to differ from that given by Mr. Turner, inasmuch as the index of e is divided by the efficiency. Let us assume the latter to be 75 per cent. (a value which is probably rather high in the circumstances).

Then taking as before :—

Gliding angle = 1 in 5.3.
Fuel (petrol and oil) consumption = 0.6 lbs.-h.p.-hour.
Length of flight = 1,800 miles.

We find on substitution that the weight of fuel necessary is .482 of the total, as against .42 given in the article.

Now, assuming that the engine lifts 33 lbs. per h.p., that the weight of engine, etc., is 4 lbs.-h.p., and that the weight of machine is one-third the whole, we have the following proportions :—

Fuel	.482
Engine	.121
Machine	.333

or a total of .936 of the whole, thus leaving .064 as a margin for pilots, food, etc.

If this latter be taken as 400 lbs. we obtain a total weight of 6,250 lbs. (i.e., about twice the weight given), which is divided up in the following manner :—

	lbs.
Two pilots	400
Machine	2,080
Engine	760
Petrol and oil ...	3,010
Total	6,250

And the size of engine works out at 190 h.p.

Supposing for the instant we allow the total weight of 3,160 lbs. given, and adjust the weight of machine to suit, we now arrive at the following distribution :—

	lbs.
Two pilots, etc. ...	400
Machine	860
(or about .27 the whole)	
Engine	380
Petrol and oil ...	1,520
Total	3,160

The weight of 860 lbs. for machine is evidently inadequate with such proportions.

As I do not wish to trespass upon your space to any greater extent, I will abstain from further considerations.

The key to the matter, however, seems to lie in designing a machine in which the head resistance is cut down to a minimum, and in then flying it at such a speed and angle of attack that the total resistance is the least possible. In this way the gliding angle will be a minimum, as also will the index of e in the expression for the amount of fuel. PITOT.

[In working out my calculations I worked throughout on h.p. delivered to the air. If, however, the weight and fuel consumption of the engine are taken in terms of h.p. given at shaft, then allowance must be made for a loss in the propeller. With regard to his last paragraph, the question of best speed for least h.p., etc. is one which I hope shortly to treat in an article.—P.K.T.]

Elementary Aeroplane Design.

Sir,—As a reader of your instructive book, THE AEROPLANE, I have noted the courtesy with which you and P. K. Turner assist the novice like myself. I think it would help others beside myself if you could help in the following :—

In designing a single-seater monoplane, will you or P. K. Turner show how, *without mathematical formula,* the novice should proceed. Thus in my contemplated machine the length over all, from front of machine to elevating rear part of tail, the length is 26 ft.; the span of the main planes, attached 3 ft. from the front of fuselage, 30 ft.; and 5 ft. chord; twin propellers, each 8 ft. diameter, at rear of planes; tail, 6 ft. wide by 6 ft. length, fan-shape.

Query 1.—How are the centres of gravity and pressure found? 2.—How is the horse-power calculated, the total weight with pilot, say, 600 lbs.? 3.—Also speed required to lift? 4.—In the books I have so far read the wind pressure is now revised to .003 lb. per sq. ft. for one-mile velocity of wind. How does that apply to the resistance of the machine and wings at an angle of 5 deg.? The tables of Lilienthal on concave bird surfaces are valueless on the above revised figure, being given as .005 lb. per sq. ft. Can you inform me where the revised tables from 1 deg. to about 6 deg. can be found, or if not, calculated? I think the above will be of use to every reader beside myself.

In your last issue, a correspondent speaking of man-power experiments states: "Why not variable-surface as in the pigeon?" Why the pigeon, since all birds enjoy the power of flexing or variable-surfacing of the wings? What is the idea of variable surface in muscular power tests? I imagine myself that the other problems of how to get off the ground, etc., were more important to learn first.

Pimlico. JAMES WRIGHT.

[1.—To find centre of gravity: Multiply the weight of each part of the machine by its distance from the nose of the fuselage (the distances being measured straight front to back, from a side elevation drawing). Add all the results, and divide the sum by the total weight. The quotient is the distance of the centre of gravity from the nose of the fuselage.

2.—Multiply the weight by the gliding angle and by the speed, and divide by 375.

3.—Multiply the weight by 150, divide by the product of area and angle of incidence, and take the square root of the quotient.

4.—The calculation of head resistance is a very difficult matter, and it is hopeless to attempt it without mathematics and experience. Incidentally Mr. Wright has got hopelessly confused between three things: resistance of a flat surface, which equals area multiplied by .003 multiplied by square of speed; lifting resistance, which depends on camber, surface and angle; and skin friction of stream-line bodies, which depends on surface exposed and on speed. (See note to letter from H. N. Parkinson, p. 44, January 11th).—P. K. T.]

Levity *v.* Gravity.

Sir,—I thank you very much for your kindly inserting my last letter, but I shall be glad if you will kindly rectify the mistake (in the heading), "A 'Hindu' on soaring flight." I am not a Hindu nor a Mahomedan, but a pure-blooded Bengalie

I am not a critic nor an expert, but after reading in your splendid paper *re* the above subject, I made a few experiments, and find that the friction caused by the speed of an aeroplane develops a certain amount of electrical power, and with the aid of the electricity in the air, or air currents, helps the aeroplane to keep up (of course, the aeroplane must travel at a good speed). If this is not correct, why will the aeroplane drop when it comes to an air pocket?

I will not take up any more space explaining reasons. Whether I am correct or not, if any of your readers will try the following experiments: Take a quill (or any other article), rub it briskly on a fairly smooth surface, and then hold over a particle of hair or any other light substance, and the said substance will fly up and touch the quill with a certain force. I have not much time nor apparatus else would have given the exact amount of (natural) power one does receive. I shall be glad if you or any of your readers could let me know if there have been any books or papers written *re* this subject [discovery of mine (?)]?

Wishing your paper every success,

Birkenhead. C. M. Seal, of Bengal.

The Lion's Share.

An analysis of the certificates granted by the Royal Aero Club up to December 31st last shows that exactly one-third were gained by pupils at the two "Bristol" flying schools at Salisbury Plain and Brooklands. These schools only started serious work at the beginning of 1911, and the work they have accomplished is better appreciated when it is borne in mind that there are something like a dozen other schools in this country. The total number of certificates granted was 168, out of which the Bristol schools secured 56. This total of 168 includes 43 Army officers, out of which 25 were trained at the Bristol schools, while 5 out of 11 Naval officers took their certificates there. Up to now the weather of this month has been very bad, and the first Bristol pupil to pass for his certificate is Lieut. Borton. Several of the 23 pupils now at the schools are, however, ready to take their brevêts as soon as the weather allows.

The Aeroplane,

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HERBERT SPENCER FLYING SCHOOL, Brooklands Aerodrome, Weybridge. Thorough instruction on the Old Engine-behind Box-kite, still the best aeroplane in the world for learning to fly. Write for particulars.

TUITION on Percival Biplane at reduced fees during the winter months. Every facility for sound and rapid instruction. Terms from £30. For particulars apply to THE AERO CONSTRUCTION CO., Brooklands Aerodrome, Weybridge.

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FILEY AERODROME. Tuition on Blackburn or Blériot Monoplane. For particulars apply BLACKBURN AEROPLANE CO., Leeds.

MISCELLANEOUS.

ADVERTISER having Aeroplane at Shoreham wishes to meet with gentleman to share shed with him. Experienced assistance if required.—Box 417, THE AEROPLANE, 166, Piccadilly, W.

POSTERS:—To promoters of exhibition flights; aviators giving exhibitions on their own account; aerodrome proprietors, &c.:—Striking posters in large and small sizes can be supplied in a day or two by arrangement with THE AEROPLANE, 166, Piccadilly, W.

Useful Model Work.

Proportional Models.

I have been asked how I arrived at the table of comparative dimensions published last week. The method of calculation employed is very simple. Take, for example, the first question: surface. Obviously, if the chord and span of the machine are each multiplied by N, then calculating the surface, we find that the wings are N times the chord multiplied by N times the span. Therefore their area is N^2 times the surface of the smaller machine. Obviously the weight must be multiplied by N^3. Now we know that the speed is proportional to the square root of the weight per square foot. Now if the weight is multiplied by N^3 and the surface by N^2, then obviously the weight per square foot is multiplied by N, and therefore the speed is multiplied by the square root of N.

The diameter of the propeller is found as follows: The thrust needed obviously depends on the weight; the weight we know is multiplied by N^3, therefore the thrust is multiplied by N^3. Now the thrust of any propeller depends upon the disc area and the square of the slip stream. If the slip per cent. is constant, the slip stream will follow the speed, which means that it will be multiplied by the square root of N. Therefore, as the disc area equals the thrust divided by the square of the slip stream, it will be multiplied by N^3 and divided by N, i.e., it will be multiplied by N^2. Hence obviously the diameter will be multiplied by N.

The power required is proportional to the speed multiplied by the thrust, and therefore will be multiplied by N^3 times the square root of N. If the propellers be of a similar type, their pitch will vary with the diameter and will be multiplied by N. The speed is multiplied by the square root of N, and since the propeller torque is proportional to the power divided by the revolutions, this torque will be multiplied by N^4. The fact that the torque varies with the square of the number of strands follows from the action of rubber when stressed by torsion; it is also ratified in the experiments with rubber motors, although only within limits, the torque being less than it should be at a low number of turns, and higher than it should be when the motor is fully wound. But it is a fair presumption to us that it does so vary. Since the torque varies as N^4, therefore the strands will vary as in N^2, an effect which is also justified by practice. From this it follows that since the total energy in the motor depends on the weight of the rubber, therefore it is multiplied by N^3.

Now, energy is equal to the product of thrust and distance, and since the thrust is multiplied by N^3, *the distance is, as stated last week, constant.*

P. K. T.

Rubber Notes.

At the present time, although there are in existence a few model motors driven by carbonic acid gas or compressed air, there is no doubt that the rubber motor is almost invariably used in aero-models, even when these models are used for scientific experiments and not merely in flying-stick competitions; and considering how important efficiency is if experiments are to be worth anything, it is surprising that so few people take the trouble to look after their rubber to the best advantage. Rubber of the quality used for motors is distinctly expensive, and has at the best only a short life; but with care this life may be extended to three or four times the usual length.

One of the first matters which claim attention in this respect is the hook over which it is stretched. The usual hook of a model is of wire about 20 gauge, bent in the form of a hook, often having a sharp V bend; and it will be noticed that the rubber invariably cracks at this bend. Now it should be obvious to all but the meanest mental capacity that no substance which is strained in the way that this elastic is strained should be bent over a thin wire. The hooks should be very carefully shaped, and then covered with thick tubing or, preferably, with a little wooden bobbin. The rubber should be carefully put on so that there is no crossing or tangling between the strands, and it is most important that each strand should be of the same length, for it is obvious that if one strand is shorter than the rest, that particular strand will be overstrained when the rest of the motor is at its normal extension, and after winding a few times, that strand will inevitably break. Lubrication, of course, is important—not only, as most model makers imagine, in order to get a great number of turns, but also because of its preservative action on the rubber.

(To be continued.)

A Good Business for Sale.

Owing to their having entered into a big contract in connection with their other trade, the proprietors of one of the most successful model businesses in the country are unable to devote proper time to it, and are prepared to sell it as a going concern at a moderate figure. Anyone interested can be put in touch with the firm *via* The Aeroplane.

MODEL CORRESPONDENCE.

Sir,—Referring to my critics of last week: I took part in "friendly contests" in 1910, I have been flying models of various types for five years, and have had many opportunities of witnessing competitions.

I am afraid I do not follow the remark about my experimental biplane (now defunct). Does it mean that if I took part in competitions I would only be permitted to interest myself in the "distance" and "duration" machines so aptly described by the Editor as "flying-sticks"? With regard to the speed of the screws, I should have said that they were fitted to the model to find its approximate flying speed, which is one of the factors which must be ascertained before designing a second pair of screws to give their maximum thrust at this speed. In any case a better thrust can be obtained (*ceteris paribus*) by driving streamline form propeller blades at a small angle of incidence at a high speed than at a large angle of incidence and a low speed, *vide* "lift and drift" tables.

I cannot agree that "distance" contests lead to finality in propeller design. The world's record for distance is, I believe, held by a machine the propellers of which are intended primarily to use up the energy stored in the elastic slowly. The blades are bent under steam and are absolutely flat and the aspect ratio very low. In fact, they are in every way unsuitable for use on a large scale. Can Mr. Clark picture the *real* experimenters—men like Lanchester, Phillips, and Maxim—competing in "distance" and "duration" events?

Mr. Turner is certainly right in saying that scientific model flying has descended to a low ebb, but it is the result of misdirected energy, not lack of interest. I cannot believe that it is only the chance of winning competitions which keeps interest in model flying alive. Very few model flyers have any idea how to experiment, and Mr. Turner's articles on the subject should be very valuable.

Mr. Pugh, discussing competitions from the financial point of view, considers that the "unfortunate brethren" should be assisted by prizes. In this I am quite at one with him. However, the competition winner is very seldom the man who has spent least on experiments. It might be a good plan to offer cash prizes for the best series of notes of experiments, but the problem of helping the impecunious inventor is one that it is very difficult to tackle.

Mr. R. T. Saunders seems to have been singularly unfortunate in his choice of members. The study of aviation is admittedly very complex, and unless model flyers are keen enough to study the literature available on the subject they would do well to take up a "less brain-wracking pastime."

I must apologise for writing at such length, but the question of the desirability of holding competitions is one that has never been satisfactorily settled.

R. V. Tivy.

Sir,—I have read with great interest Mr. Saunders's letter, as I have for a long time held the opinion that model flying as advocated by Mr. P. K. Turner and others is far too serious and deep a subject to take up as a mere hobby, unless one has a good technical education and plenty of spare time and money.

I took up model flying some time ago, and although I had excellent *practical* results and understood the broad principles of the flight of the machines yet I was dissatisfied because I did not understand the theory of the thing.

After keeping on for about six months in varying shades of enthusiasm, I decided that my time and money would be better spent studying my own trade. In future I shall be content to stick to my own occupation and watch the efforts of the *real* designers to produce the perfect aeroplane.

Beckenham. "Demos."

Sir,—Being a reader of your valuable paper, I am delighted to see at last someone besides myself is beginning to count these flying stick clubs as nothing but a waste of time. Now I notice in your last issue (the 11th) two beautiful models,

one of Mr. Tivy's and one of Mr. Viger's. These are the sort of models that are worth looking at.

Of what use are those that you have to hold up and loose straight off—these wonderful one mile flyers? Prizes should not be given to a flying stick when there are beautiful models of aeroplanes that will rise off the ground under their own power, and have taken three times as long to make, in the same competition.

If we are going to introduce aero-model clubs to the public, let the machines be models of aeroplanes, so that people can understand what they are.

Crewe. A. MOSES.

Sir,—In reference to Mr. H. T. Holman's inquiries in relation to my distance record of 1,400 yards made over Mitcham Common, November 25th, I have great pleasure in answering his queries as follows :—

(1) The country traversed was approximately level.
(2) The prevailing wind varied between 15 and 20 m.p.h.
(3) Each motor was wound to just under a thousand turns.
(4) The distance was measured in a straight line between launching point and landing point. This, I may add, is my invariable practice.

Surbiton. R. F. MANN.

Sir,—We notice Messrs. Mann and Grimmer advertise their machine as flying at Brighton on September 16th last and taking the alleged 100 sec. duration event. We should like to point out that Messrs. Mann and Grimmer did not compete at that meeting, and that the prize in question was won by Mr. H. W. Willis, of Willis Bros., with a machine quite different in size and construction to the Mann. We shall therefore be obliged, as this so prominently appeared in your paper, if you will give this an equally prominent notice, as we are constantly being asked by those who know H. W. Willis as the winner if that is right. Further, we notice that the two prizes won by us at Brighton have been added to the list of "Mann" successes. WILLIS BROS.

CLUB NOTES.

N.B.—Club Notes must be posted to 166, Piccadilly, to arrive not later than first post Monday morning, and should be made as brief as possible.

Paddington and Districts Aero Club.—Particulars of Canning's large duration model : 5 ft. long, 3 ft. span, 13 ozs. weight. Two skeins of elastic geared together on each side of single stick. Two 12 in. propellers weighing ½ oz. the pair ; 3,000 turns on each propeller, and the duration 3 mins. Model has been tried, but needs more power.—W. E. EVANS, Hon. Sec., 133, Buchanan Gardens, Harlesd n, N.W.

Reigate, Redhill, and District Aero Club. — Good meeting on 21st, Wilson and Lewis getting third-class certificates. Wilson made duration flight of 50 secs., club record. He and Lewis made flights of over 350 yards, Sutton and Morris doing about 200 yards. Sutton smashed up after nearly 300 yards.—HAL. V. MAY, Hon. Sec

Ealing and District Aero Club.—Poor attendance at meeting of 20th. Decided n t to proceed with election of committee. Members urged to attend meeting on 27th, to arrange further meeting. Attraction of Saturday afternoon Bostock's 0—1—2P—1 model, which flew high and fast. An 0—2T—1—1 model tested by L. Roche, while C. Roche tried self-raiser. Flying meeting, 27th, 2.30 p.m., at usual place. Those interested, please communicate w th B. J. KIRCHNER, 1, Queen's Gardens, Ealing, W.

St. Mary s Model Aero Club (Portsmouth)—First monthly competition held Jan. 20th. Results Distance—first, Eburne, 180 yards : second, C. Restall, 155 yards ; third, Johnson, 124 yards. Duration—first, Eburne, 28 secs. ; second Johnson 15 secs. Triangular course of about a quarter mile, all sides across wind, Collett only completed, others stopped by dark.—H. W. A. JOHN ON, Hon Sec

Bristol Model Flying—Meeting on Downs on 20th. Excellent high flights, in spite of gusty wind, by those present last week. Smith's 1—1—P flew nearly straight. Smallcombe experimenting with bi-cylindrical gliders, flew twin-screw machine of this type, which showed remarkable lateral stability. Design of machines and propellers rapidly improving. Meetings at Sea Walls every Saturday at 3 p.m.—R. V. TIVY, 3, Royal York Crescent, Clifton, Bristol.

Blackheath Aero Club.—Fine flights at Kidbrooke on Saturday last. Pizey with new single-sticker, and Brown, of New Cross, experimenting with tractor, self-raising monoplane, and Woollard, Egelstaff, Waghorn, and Clark flying usual types. C ark and Brough practising on Heath, afterwards joined rest, at Lee, where Waghorn got second-class "ticket." Plummer flying new small model, and Packham and Dodd tuning up new tractor mono. On March 9th Kidbrooke, 3 p.m., point-t -point competition for silver cup, for members only. Competitors to fly round triangle with 250 yd. side ; member returning to starting point in least flights to be winner. Any size and type, but competition postponed unless six members complete first side of triangle. Usual flying this week at Blackheath, Kidbrooke, Lee, and Grove Park. Committee want more members. Full particulars from L. BROUGH, Asst. Hon. Sec , 12 Manor Road, Brockley, S.E.

Aero Models Association (Northern Branch).—Twenty flyers and over ninety spectators out on 20th for distance event at Finchley. Winner of 5s. of goods offered by R. G. Corder & Co., A. Houlberg, 1,144 ft. ; second, C. R. Brown, 812 ft. New Clarke racer under test by Corder, but smashed fuselage. Root, Partridge, L Tarsh, and Fletcher models flew well. Social evening, Feb. 3rd, 15, Highgate Avenue, Highgate, N. All interested invited. —MALCOLM B. ROSS, Sec.

Worcester Model Aero Club (Victoria Institute)—On 20th, club ground covered with snow, but eight models out. Flying as usual next Saturday, and point-to-point contest. New members welcome.—E. W. HARRISON, Asst. Sec.

Brighton and District Model Aero Club.—Bate and Burghope flying well at Shoreham n 20th. Bate, with light monoplane, broke club's duration record with 61 secs. Burghope flew fast model, which in one flight looped the loop three times, got up to over 150 ft. in about quarter time required by "army specification," and did beautiful *vol plané* at about 1 in 3. Flying next Saturday at Shoreham. All communications to A. VON WICHMANN, Hon. Sec., "Kingsleigh," Kingsway, Hove.

Reading Society of Model Engineers.—Meeting Jan. 19th. Decided to form Aero section. Several members possess models, and good flights have been made. Workshops at 33, London Street, equipped with lathe, and good stock of tools, etc. Particulars from Hon. Sec., FRED HART, 81, Whiteknights Road Reading.

Birmingham Aero Club.—Haddon Wood model flying about 200 yds., Trykle getting a minute several times. Monthly meeting Feb. 5th, at Bell Hotel Phillips Street, 8 p m. Non-members invited. Mr. E. Trykle will give lecture on models.—G. HADDON WOOD, Hon. Sec.

Conisborough and District Aeroplane Society.—Concert in Church Hall on 16th. President (J Brocklesby, Esq., J.P., C C) spoke of aeroplanes in Turco-Italian War. Hon. Sec. spoke of society's performances and future, and a sketch was given. The concert cleared £2.—JOHN I. WEBSTER, Hon. Sec.

Manchester Model Aero Club.—Illustrated lecture on "Progress of Mechanical Flight," by Mr. J Carr, in Y. M. C. A building, Peter Street, Jan. 31st, 8 p.m. All interested cordially invited. First flying meeting at Aerodrome, Trafford Park Feb. 3rd, at 3 p.m. All members earnestly asked to ttend with models.—KENMURE KINNA, Hon. Sec.

Dover and District Model Aero Club. — Meeting at Northfall Meadow on 20th. Best flights by Who well, Holman, Joyce, Davis, and Wicks Whorwel got second class certificate, and Holman passed two tests for third class. Davis unfortunately smashed one model in first flight. Meetings at Northfall Meadow Wednesdays and Saturdays. New members heartily welcomed.—R. C. WILSON, Assistant Secretary.

Hackney and District Aero Club. — Model demonstration on Hackney Downs on 27th, all interested heartily welcomed. More members still wanted. Send postcard to B. H. LONGSTAFFE, 47, Jenner Road, Stoke Newington, N.

MODEL ADVERTISEMENTS.

BUSINESS FOR SALE. Models and accessories. Business connection for sale, same name can be used if desired. Takings average £18 a month. Owners have to sell owing to undertaking important contract.—Apply first instance X. W. V., c/o THE AEROPLANE, 166, Piccadilly.

THE Ideal Motor for the model builder is the Ideal Model Turbine. Weight ½ pound, ⅛ h.p. at 2,000 r.p.m. Lists, stamp. S. SUMMERFIELD AND CO., Melton Mowbray.

MODEL PROPELLERS—Genuine CHAUVIERE—8in., 10in. and 12in. diameter, always in stock. Geo. W. Goodchild and Partner, 30-32, Farringdon Road, London, E.C.

NEW Catalogue of Model Aeroplane Accessories now ready. J. BONN AND CO., LTD., 97, New Oxford Street, London. W.C.

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A GRAND OPPORTUNITY.—W.H C. TRACTOR-DRIVEN MONOPLANES (made to order only) ; guaranteed ; post free, 12/6. GEM BIPLANE, best ever turned out, rises from the ground ; twin screw ; 12/6. LITTLE GEM MONOPLANE, twin screw, best value, splendid flyer ; post free, 3/-. W.H.C. ¼-MILE PRIZEWINNER, needs no describing ; everybody uses these machines for winning competitions. 580 yards straight flight—not a bad record, is it?—for 6/- post free. SKYHOOK, rises from the ground, prizewinner, post free, 6/- ; twin screw, unbreakable. ¼ in. strip elastic, 1/4, best made ; $\frac{3}{32}$ square, 1/6 doz. ; $\frac{3}{16}$ strip, 10d. ; narrow strip, 9d. Send for list of Accessories — WESTON HURLIN CO., 2, Edbrooke Road, Paddington.

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THE RETURN OF THE PRODIGAL.

Mr. T. O. M. Sopwith, after flying in America all last summer, signalised his official return to Brooklands on Sunday last by some startling flying on his 70 H.P. prize-winning Blériot. He is here shown diving over the sheds into the landing ground, after his first flight in England on this machine.

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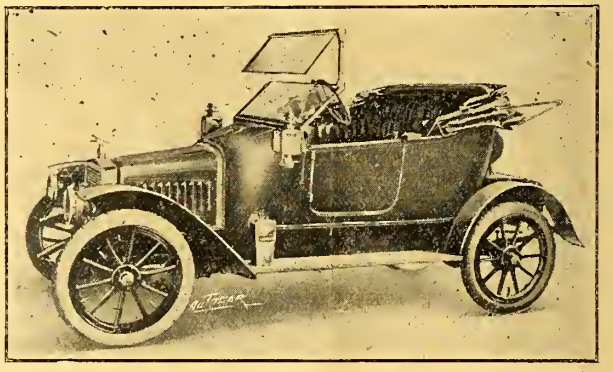

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LOCAL PATRIOTISM.

Things in this world have a queer way of working themselves out. A week or so ago The Aeroplane duly notified the fact that a scheme was on foot to rouse local patriotism, as it has been roused in France, and institute a subscription scheme in this country whereby each county or city could supply one or more aeroplanes to the Army. At that moment the writer was not permitted to make known the name of the organisers of the proposed scheme. Now, however, the said organisers have made their own announcement, and one is at liberty to make public the fact that the proprietors of *Vanity Fair* are fathering the scheme.

That such a piece of pure common sense and patriotism should have been brought forth by the professedly cynical, and at times even frivolous, *Vanity Fair*, is quite in keeping with the topsy-turvy way in which aviation is choosing to develop in this country. And, as if to increase the strangeness of things, the scheme, which has been received with approval by everyone concerned, has but one adverse critic, and that an aviation paper, which might have been expected to have given the idea unqualified support, but which chooses, instead, after approving the similar effort in France, to damn it with faint praise in this country on the plea that "while the idea is a very excellent one, and much to the credit of our contemporary, we doubt that the time is ripe for emulation in Great Britain."

Grammar apart, it is hard to see why the time is not ripe; the need for aeroplanes is greater in this country than in any other, and though, of course, the authorities would be bound, in the natural course of affairs, and in their own good time, to wake up and give us the necessary machines in the distant future, the real necessity for machines is in the present moment. If the idea of supplying machines through the rousing of local patriotism should be postponed and revived in a year or so, the time would be very considerably over-ripe. Therefore, the machines must be acquired now, or not at all.

It is better to praise with faint damns than damn with faint praise, and, really, the only possible criticism is that it is wrong in theory that "the State" should be assisted by private charity. Apparently, there is no official objection to private charity, and the patriotism of Mr. Frank McClean in lending his Short machines to the Admiralty in the past, and to the Territorial authorities more recently, have been productive of wholly excellent results, as has Mr. G. B. Cockburn's charitable action in training both naval and military officers to fly without cost to the nation.

As Mr. de Holden-Stone points out in his pithy article on the subject in *Vanity Fair*, "the State" is just our plain selves, but according to the logic of the critics of the scheme, Rowton houses, Passmore Edwards hostels, Carnegie libraries, and all our great hospitals are equally unworthy of support, as are all institutions for human relief, except the workhouse, the jail, or the Embankment, the only institutions run by the State. Still, when the State does not do its duty, the people of the State must depend on private enterprise.

The fleet which defeated the Spanish Armada was raised by public subscription, or by private enterprise, at a time when the Royal Navy of the period was almost non-existent owing to its having been treated by the Great Elizabeth with a parsimony worthy of the British War Office. In fact, the position of the British Navy of Elizabeth's day and the Air Battalion to-day are almost analogous, except that the fleet then was not quite so vital to the country's safety as is the air corps to-day, because our army was then a better match for those of foreign countries. Let us all, therefore, do our best to make the project a success, if the promoters ultimately undertake it.

It may be that for reasons of policy, though not of politics, the high officials at the War Office cannot give the scheme their official support, but it is absolutely certain that it has their personal sympathy. And, though *Vanity Fair* is primarily a Conservative organ, and a high-class sixpenny weekly at that, it should surely be possible for intelligent persons of all kinds throughout the country to sink their political feelings and help in every way within their power. One might, however, suggest that if a big popular daily took the idea up in conjunction with the weekly it would be more successful still.

The scheme, for which *Vanity Fair* gives every credit to *L'Auto*, of Paris, is briefly this. It is proposed that committees shall be formed in every county, and that each committee shall organise regular subscriptions throughout its district, the sums demanded being quite small, and numbers being trusted to supply the amount, for it must be recollected that it does not take very many shillings to buy an aeroplane (about 10,000 shillings would do), especially because, if the scheme succeeds, as it deserves to do, the machines will be bought in quantities. It is provided that all machines ordered and purchased by the Selection Committee, for which nobody in the trade shall be eligible, shall conform in all respects to the requirements stated in the conditions of the forthcoming War Office trials. It is

further provided that in order to secure the best machines for the country, and for the sake of helping to build up an adequate British industry, it shall be made a condition that all machines shall be built in the United Kingdom by British labour, and by British materials throughout, no matter whence the design.

A suggestion is also made that should the War Office accept the offer, although the machines bought will be placed absolutely at the disposal of the War Office, they should, if possible, be kept in the counties which had subscribed, and as near as possible to each county's regimental depôt or depôts, provided, of course, that there is suitable ground for an aerodrome in that district. It is possible, however, that this arrangement might be open to objection for strategical reasons.

It is sincerely to be hoped that the plan will be a success; and, though there may be plenty of excellent reasons given by those at the War Office who are opposed to aviation why the gift should not be accepted, such as, for example, that there are neither pilots to fly them, nor sheds to house them, if they are presented, it is to be hoped that those in authority who are really sympathetic to aviation, and who realise its present necessity to the country, will succeed in forcing the hands of the reactionaries, and will allow local patriotism to do what official apathy has left undone.

OFFICIAL REASONS.

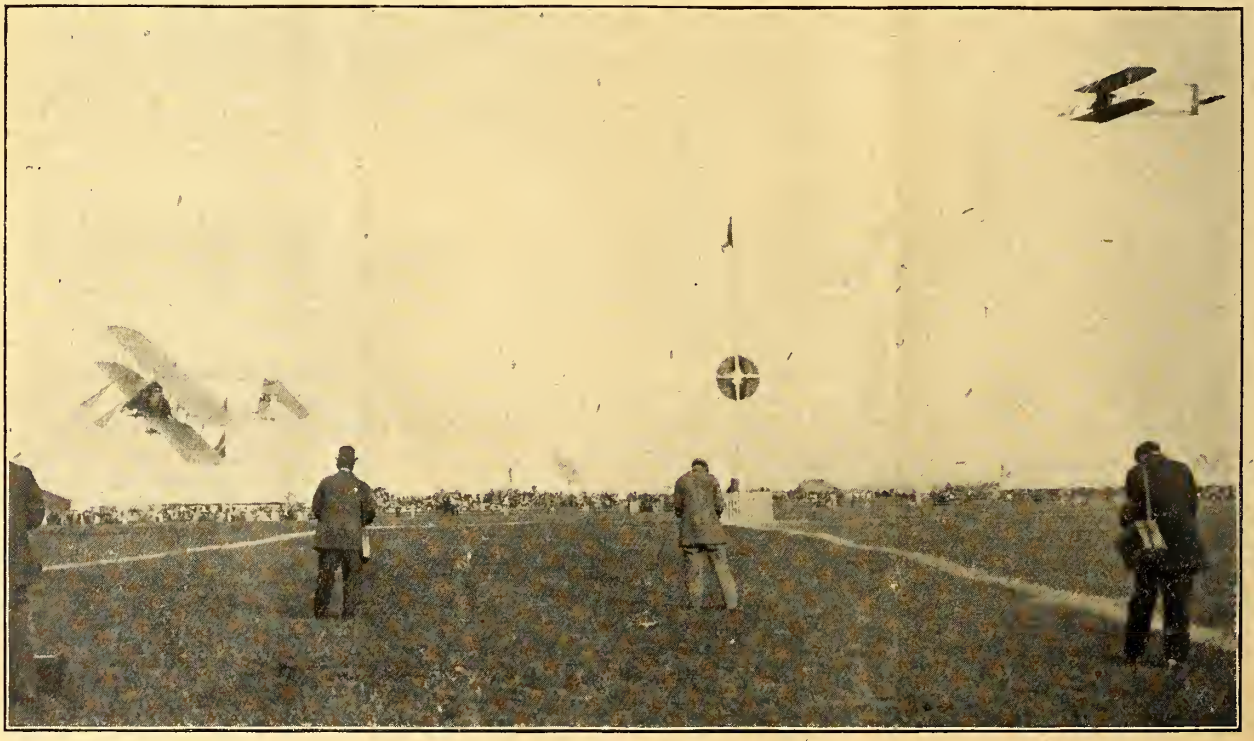
There is a story pertaining to the early greatness of Napoleon Bonaparte, that shortly after he had been appointed First Consul and Generalissimo of France, he came in state to a fortified place in the South, which failed to greet him with the salute of many guns which was his due. The Commandant of that place, on being haled before him, explained humbly that there were exactly twenty-one good and sufficient reasons why he had not fired the fit and proper salute, the first reason being that he had no guns. History does not record verbatim what Napoleon told the Commandant to do with his other twenty reasons, but it records elsewhere that Napoleon was a person of hasty temper and of Rabelaisian tongue, and on this occasion it leads one to suppose that his injunctions were precise and thoroughly adequate.

When Parliament re-assembles it is quite possible that awkward questions may be asked about certain matters connected with the Air Battalion, to which attention has been drawn in The Aeroplane and in Mr. C. C. Turner's trenchant articles in *The Observer*.

Of course, Parliamentary etiquette demands that the best possible complexion shall be put on everything done by Governmental Departments, and, as in the case of the French Commandant, there are always subsidiary reasons to be found for any action by anybody, so it often happens that the official reason given for a thing done by a department is a very subsidiary reason indeed, and quite harmless, while the primary and possibly most reprehensible reason is kept carefully concealed so far as the public are concerned.

But, fortunately, that does not mean that the authorities do not know the real reason, and that the delinquents are not duly hauled over the coals for it.

It has even happened that an official has been publicly promoted for the official reason and privately cashiered for the primary reason of the same action. Just as one occasionally finds a member of Parliament, who has a talent for doing the wrong thing,



Mr. T. O. M. Sopwith on his Wright biplane rounding a pylon at Nassau Boulevard. This machine is now flying at Brooklands. Behind him is one of the U.S. Army pilots.

promoted to the House of Lords to keep him out of mischief.

Hence one may assume that at times, for reasons of public policy, official reasons are intrinsically worth exactly as much as were the twenty subsidiary reasons of the Commandant.

However, these official reasons are not without a certain academic interest, and it may be entertaining to give those which are supposed to explain some of the recent eccentricities in the maladministration of the Air Battalion. Possibly others may be found, but those which follow hereafter are those which are most likely to be given officially. For brevity's sake let us give the points as questions and answers :—

Why are army pilots only permitted to fly across country between Salisbury Plain and Farnborough? *Primary Reason:* To keep them under the thumb of Farnborough and prevent independence of action or spirit. *Official Reason:* To reduce expenses in case of compulsory descents far from home, because the Aeroplane Company on Salisbury Plain is there simply to test different types of machines, and not for the purpose of training army aviators in the art of cross-country flying.

Why was a circular sent out advertising for Royal Engineer officers to join the Air Battalion? *Primary Reason:* Because it has been quietly arranged that the Air Battalion is to be an all-Sapper unit. *Official Reason:* Because an officer of the Royal Engineers on the Headquarters Staff at Farnborough is likely to go to India at an early date, and it is necessary that his place should be taken by another R.E. officer, the rank and file of the battalion being engineers.

But why should R.E. officers only be appointed, and why need the battalion be an R.E. unit? *Primary Reason:* Because somebody in the battalion happens to be closely related to somebody at the War Office, and it is evident that there must eventually be highly-paid appointments in connection with military aviation, and, therefore, it will be well to keep the whole battalion in the hands of the Engineers. *Official Reason:* Because aviation, being a new science, it should be in the hands of the scientific branch of the Service, and because, as in the answer to the previous question, the rank and file, being Sappers, require Sapper officers.

Then why was it necessary to advertise for Engineer officers instead of simply appointing them? *Primary Reason:* Because Air Battalion officers draw Engineers' pay, so that there is no advantage to an Engineer officer in joining the Air Battalion, except the honour and glory of being an army aviator, which apparently does not appeal, for not a single Engineer officer had applied for appointment prior to the issue of the circular. *Official Reason:* Engineer officers only being necessary, it was not necessary to invite officers of other branches of the Service to volunteer.

Why are not officers already holding aviators' certificates attached to the Air Battalion, as announced some months ago? *Primary Reason:* Because all these officers belong to other branches of the Service, and if once attached might secure permanent appointments. *Official Reason:* Because the early part of the year is unsuitable for the Reserve Officers' Course, which cannot commence till April or May.

Why are not more aeroplanes bought from British constructors? *Primary Reason:* Because it is the intention of a clique at the War Office, influenced by civilian interests, to spend all the money obtainable on equipping the Aircraft Factory so that it can turn out machines in quantities and provide well-paid employment for the friends and relations of the officials. *Official Reason:* Because it is not desirable to purchase machines in quantities until something approaching a standard type has been evolved.

Then why are foreign machines bought? *Primary Reason:* To provide the Aircraft Factory with the latest French designs as models, the French constructors not being on the spot to raise protests, whereas direct copies of British designs might arouse awkward questions of patents and registered designs. Also the authorities still believe French machines to be the best, as they judge entirely on performances in competition, and not on design or workmanship. *Official Reason:* It is desirable to test machines of all types, and the performances of British machines can be observed on the spot without purchase.

But this list of diverse reasons can be elongated *ad nauseam*, so what is the good of continuing? Enough has been said to show that the official reasons, while the truth and nothing but the truth, are by no means the whole truth.

The Alexander Engine Competition.

Some weeks ago it was announced that the tests of the various aero-engines entered for the Patrick Alexander Engine Competition had been completed, and that the winner of the £1,000 prize would shortly be announced by the Committee, which consists of members of the committees of the R.Ae.C., the Aerial League, and the Aeronautical Society. We are still waiting for that announcement, and it is really time the result was known. The writer understands that the actual award has been delayed owing to the absence of Mr. Patrick Alexander himself, who is abroad; but that does not seem to be sufficient reason for holding back the committee's report. At the present moment numerous aeroplane manufacturers are on the point of deciding what engines they will use in the War Office Competition, and it is obviously unfair to those engine makers whose motors may have done well in the Alexander Competition that they should be deprived of the benefits of their performances therein, for, even if certain engines did not actually win the prize, there might be certain features in their performances which would decide aeroplane builders to fit them in preference to foreign engines. In this way, so far from helping the British engine-maker, the Alexander Competition may well have harmed him, for this delay is apt to give the impression that no engine has done well enough for its performance to be made public.

The German Emperor and Aviation.

On January 27th the German Emperor celebrated a birthday, an event seemingly of but little interest to aviation. It pleased his Imperial Majesty, however, to manifest his interest in the aeroplane by granting a sum of £2,500, to be payable on his next birthday, as a prize to the constructor of the best German aeroplane motor. The regulations for this competition will be drawn up by a committee selected from members of the Imperial Aero Club, the Association of German Aeroplane Manufacturers, and of representatives of the Ministries of the Interior, the Admiralty, the War Office, and of Public Instruction, and one from the Technical University at Charlottenburg. Judges appointed by this committee will select the winning motor, and the prize will be awarded accordingly. That aviators should wish the German Emperor long life is natural.

A Good Record for Hungary.

M. Adalbert de Pivny, the secretary of the Aero Club of Hungary, in the course of correspondence with The Aeroplane, says that there has been no fatal accident in his country. The injuries to one Hungarian pilot, Mr. A. Zselyi, who is not a certificated aviator, did not kill him. This gentleman appears in most lists of fatal accidents as Mr. Zosely: the above is, however, the correct spelling of his name.

AIR CURRENTS.

Micky Halligan and the Height Record.

Thirty-five thousand, is it? A fine performance, and here's good luck and long life to the lad. But none of ye will ever touch the height record Micky Halligan made, though 'twas never officially recognised by the F.A.I. Micky was, and is, one of the best. He was a lad of twenty-two then, as full of fun as a kitten, and one of the finest flyers that ever handled a control.

"I am out for height," says Micky one day; and he gets out his hundred-horse racer, fills up with every drop of petrol he can carry, and goes off, up and up, far above the clouds, till suddenly he sees before him a handsome pile of white buildings, very bright and spick and span, with a big brass gate in the middle.

"'Tis one of the dilusions I have read of in the illusthrated papers," says Micky, and steers straight for it; and he realises that 'tis no dilusion at all, but perfectly solid, just in time to switch off and land neatly in front of the gate.

Me hero climbs out of the machine and looks round him, very much puzzled; and a little gate opens be the side of the big one, and a sturdy-looking elderly gentleman comes out. "Pleased to see you, Micky!" says he, very friendly. "This is lithrally a flying visit, I take it, for we do not ixpict you here as a permanency for a long time yet."

"Ye have the advantage of me, sir," says Micky politely. "Could ye be so kind as tell me where I am at all?"

"Don't ye know me?" says the old chap, with a twinkle in his eye. "There's a statue of me be the chapel door at Ballyracket—though, to be sure, 'tis a shocking bad likeness, and next time ye see Father Doyle ye may tell him I said so."

Sure enough, 'twas the blessed St. Peter himself. And the great confabulation they had! Micky showed Peter all the points of the machine, and Peter apologised because 'twas against the rules to ask him inside, and told him what an inthrest they took in aviation up there, and all about the great row he had with Simon the Sorcerer before the Roman Imperor.

"The point I objicted to being," he says, "that the fakement he went up in was *not* a flying machine at all at all, but a diciption of the divvle. Though, for that matter, some of the modern machines are little else."

"And may I ask," says Micky, "who is the pathron saint of aviation?"

Peter looks solemn. "I regret to state," says he, "that no official appointment has yet been made, no suitable applicant for the post having come forward. In plain English, sorra a wan of the lazy gorsoons will take on the job.

"'Tis the motor-cars that have scared them. Since Christopher took them over, no peace has he had day or night. Niver a moment but there are hundreds of motorists all over the world, all in different sorts of trouble, and he fairly disthracted with trying to help them all out at once. Sure, Christopher's desthroyed on me intirely. And what sort of time is the pathron of aviators likely to have? No wan will face it single-handed, and 'tis my belief the work will have to be dealt with by a committee. Ye know very well, Micky, that for all your innocent face, 'twould be one saint's work begging you off for the language ye use over that roaring, ill-smelling, oil-spatthering monsthrosity of an engine ye're so proud of."

Micky had the grace to blush. "D'ye think an aviator has any chance of getting up here at all—I mean be the regular way?" he asks meekly. "Some people think not."

"Niver doubt it!" says Peter, slapping him on the back. "There's a good few inside already, and fine fellows, too. Stick to aviation, Micky, and ye'll get your share of Purgathry over and done with in the present world. As for what people think, I may tell ye there are many arrivals, both here and—elsewhere, that find the society surprisingly different from what they had ixpicted."

"Thank ye kindly," says Micky. "I have greatly enjoyed your improving conversation. And now, talking of the world, I think I'll be getting back again; for, to tell ye the truth, I haven't had me whack yet. But how I will find me way I do not know."

"I will provide ye with an escort," says Peter; and there beside them was a fine, upstanding young man, seemingly about Micky's own age, with a smile to warm you like sunshine. And Micky saw at a glance that here was the finest flying machine ever made. (He noticed his wings particularly, he said afterwards, and they had a very high aspect ratio, with the true Phillips entry and a pronounced dihedral.)

"Ye're a namesake of mine, Micky," says the newcomer. "I will *not* give you an exhibition flight, because if I did you would never care to fly an engine-driven machine again. But I will pilot you back, as easy as sliding down the banisters; and when ye are due up here again, meself will run down and fetch you. You'll find the journey quicker and safer than by aeroplane."

Anyway, that's the tale Micky told us when he came back to the sheds. And that's how Micky Halligan made the World's Height Record; for 'tis the tallest story I ever heard in me life.

M. L. Elliott.

Sweet are the uses of an Aeroplane.

Paris, January 21st.

An amusing incident arising out of M. Lépine's interdiction against throwing handbills on the streets happened in Paris yesterday afternoon. The victim of one of the first prosecutions was the aviation pilot, Védrines. Towards four o'clock people saw a monoplane circling above the Chamber of Deputies. Those who were nearer the Chamber saw that the pilot was distributing handbills.

A policeman took note of this, and discovering that the pilot was Védrines, initiated a prosecution. The handbills contained the words, "Let France have the aeroplanes she needs."

I wrote a book when I was young—
The publishers refused it.
And afterwards I wrote a play,
But no one ever used it.
Since then I've written several books,
And heaps of plays as well;
Yet with the cussedness of things
They neither take nor sell.

But now I know what I shall do—
The plan's not mine, admitted—
(Oh, plagiarism, in thy name
Are many crimes committed!);
So in an aeroplane designed
For throwing bombs about,
I'll fly up Fleet Street and the Strand,
Where publishers hang out.

Then at the time when they retire
To feed the inner man,
I shall proceed to demonstrate
The beauties of my plan.
There like an angel poised above,
With wings outstretched to bless,
I'll deluge an ungrateful world
With showers of MSS.

D. M. H.

"The Expert."

There is a story going the rounds about an official of the Army Aircraft Factory which is too good to lose. First, be it said, there are some really good men in the Factory who could design excellent machines if they were allowed to do so, but a certain "expert," whose knowledge of aviation has been acquired in the proverbial "five minutes," insists on improving their designs till as a rule they do not work as they were intended to do, or in any other way. One day recently, about dinner time, when all the hands were out and about, a certain aviator landed near the Factory, and his machine was promptly the centre of interest.

The "expert," always anxious to be "in the picture," so to speak, nobly volunteered to swing the propeller and start the engine up, and scrambled through the tail booms, amid adjurations not to stand so that the propeller could hit him, and to look out for back-fires, etc. Having duly arrived at the propeller, and having grasped it in the proper picturesque pose, he was suddenly confronted with an awful problem. Finally, amid roars of laughter from the crowd, he was compelled to ask: "Which way shall I turn it?"

The pilot's reply was illuminating: "Swing it so that the draught pushes you away from it, and doesn't suck you into it."——The "expert" was positively green with annoyance.

* * * * * *

It was one of The Aeroplane's correspondents who, on being asked in what branch of H.M. Service he was, remarked that he was really a "*ventre-à-territorial.*"

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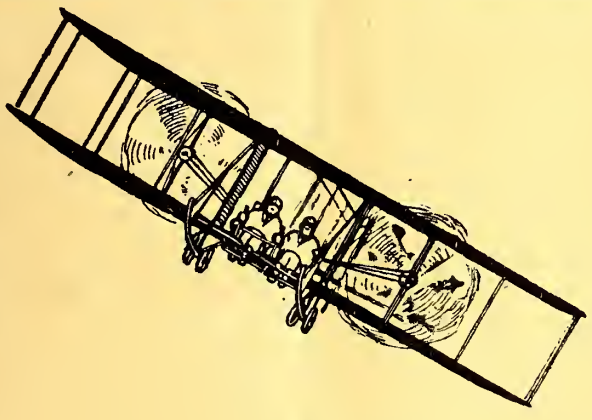

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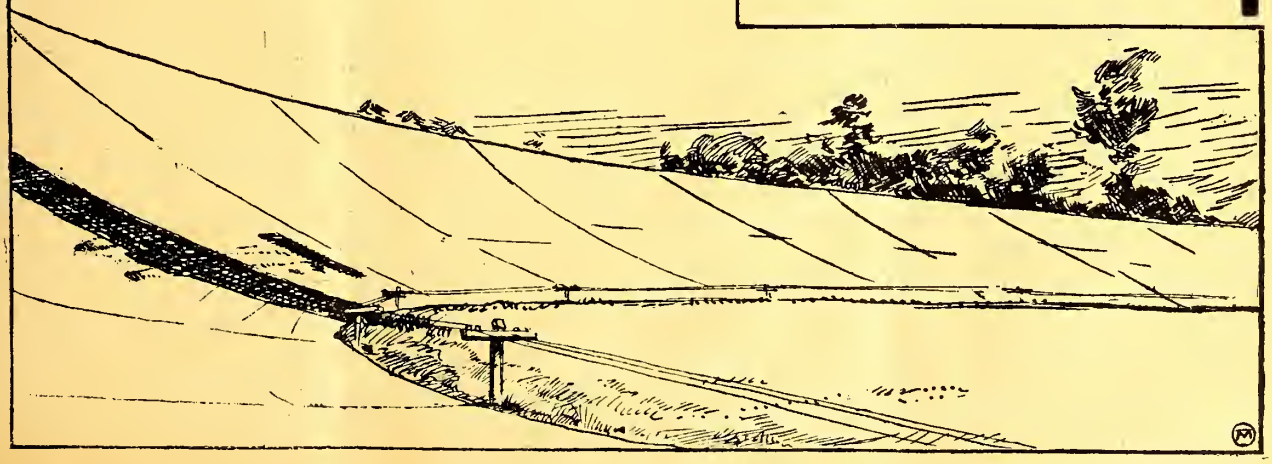


On the Rational Expenditure of Aviation Grants.

By W. E. de B. WHITTAKER.

As was stated in these columns last week, the representations of General Roques, Inspector-General of Military Aeronautics, to the Minister of War, have after a lengthy discussion between that Minister and the General Staff of the Army at last taken effect, and the French Army is to apply for a grant this year of 22,000,000 francs to spend on aviation.

The lack of money is troublesome in the extreme, but a sudden glut of it has its difficulties as well. One has made careful plans for the allocation of money economically to each separate purpose. Every detail of expenditure is arranged, and all is ready to run smoothly when the unexpected gift of three times as much upsets all the perfect arrangements. The larger sum of money must be spent usefully and in the same time as the smaller, and to as good a purpose. This state of affairs usually ends in waste. During the year French military aviation is likely to be in this position of having an unexpectedly large sum of money at its disposal, and the authorities are put to it to devise means to spend this money in the best manner possible. No easy task, and those who have called most loudly for the increased grant will now find that it is no child's affair to dispose of their supplies entirely to advantage. The future of the French Air Corps depends very largely on the work to be done in this coming year. Lay the foundations badly and the whole edifice will suffer, and the expense ultimately incurred in putting things right will be far greater than the amount initially expended.

To-day France possesses several large military aerodromes, mostly in a state of neglect, and about two hundred and fifty aeroplanes of greatly varying grades of efficiency. Nearly two hundred and seventy officers hold the pilot's certificate of the French Aero Club, and a large number of them have successfully carried out the conditions of the superior brevêt (military) and are pilots of considerable skill. It should be recollected in passing that the great majority of French civilian pilots are, in consequence of their compulsory military training, potential soldiers, capable, with extremely little practice, of taking up the duties on active service of observers or pilots.

So far, with all the experience gained, grounds, and machines acquired, and pilots trained, the almost entire lack of reasonable organisation has nullified the greater part of the advantages the French have had in the past. Large sums of money have gone, in a spasmodic manner, to repairs that would not have been required had reasonable attention been paid to such matters from day to day. Therefore a certain portion of the new grant will be required to consolidate and put the present establishments in proper condition.

It should be clearly understood that the expenditure on dirigibles remains the same. No alteration in the present programme is intended. France is quite satisfied so long as the German fleet of dirigibles does not hopelessly outnumber her own. The authorities are in doubt as to whether the large expenditure necessary for the building and maintenance of power-driven balloons is justified by results. In any case, the enthusiasm of the present is for aeroplanes.

During the year it is proposed to add at least three hundred aeroplanes-" of-war " to the air corps, in addition to the twenty machines due as a result of the military trials at Reims. The aeroplanes at present in the possession of the army will be used chiefly for the training of pupils, except such machines as are of the latest type, such as the military Nieuports, Blériots, and Deperdussins. More trouble will be taken to induce makers to produce an actual aeroplane-of-war suitable for active service.

New official aerodromes will be opened in various places, chiefly on the important frontiers. Detachments are to be organised for service with the various army corps, and to work with them under peace conditions as well as in times of war. Necessary increases of pay must be made, and a large number of officers and men will go through periods of training as pilots, observers, and mechanics. In such manner the grant will be absorbed, but, as has been said, unless great care be exercised, there are countless lanes for leakage and waste. Withal one can felicitate France on its progressive policy and watch the course of affairs.

A Putative Million.

It may not be uninteresting to contemplate the possible methods of expending £1,000,000 on military aviation in Great Britain, supposing some beneficent deity ordained that wisdom should enter into the brains of those who sit in a palatial office in Whitehall and rule the destinies of the British Army, and that such a grant should be made. Miracles sometimes happen, if the daily Press is to be believed, and things far more wonderful have occurred than the acquisition of common sense by the War Office staff.

Let us take it for granted that the Army Estimates for 1912-13 make adequate provision for aeronautics. The field over which expenditure may be spread is large. As practically nothing has been done, whatever plan may be eventually decided upon can be carried out without fear of complication from existing conditions.

After the purchase of a few machines essential for the immediate training of military pilots and the issue of grants to certain approved officers, that they may learn to fly at the ordinary flying schools of the country, the first important outlay will be the formation of a large aviation camp, to be used as a central training school in aeronautics for the entire Army and to be the headquarters and depôt of the air corps. Salisbury Plain, where at present there is a nucleus force, would be eminently suitable. So soon as the necessary sheds were erected and plant installed, aeroplanes might be purchased and the training of pilots and observers, an urgent matter, could be carried on, whilst aviation camps in each of the great commands were in process of formation.

Before any large number of aeroplanes can be bought it is necessary to build sheds in which to keep them, and to acquire grounds over which they can be flown. This is too often forgotten by those who are anxious, either from academic reasons or those of business, to induce the War Office to make immediate large increases in the number of machines in possession of the Army.

The use of civil aerodromes as permanent stations by the military authorities is inadvisable for many reasons, even supposing sufficient space to be available. A certain number of sheds could be taken in each civil aerodrome by the Army for use on cross-country journeys, etc. There are in Great Britain many places which, while not suitable for the founding of an ordinary aerodrome, owing to the difficulties of communication or the distance from large towns, could be used as army flying grounds. Salisbury Plain as the headquarters camp is an

A weird German monoplane, with two covered fuselages and one propeller between them. In view of its peculiarities, the designer's name is distinctly apposite.

obvious selection and is at the same time ideal for the purpose. Other places suggesting themselves as official flying grounds are The Curragh, the Yorkshire Moors, the flats of Southern Lancashire, parts of Somerset, and the Lothian plains. This work of selecting and arranging suitable grounds would absorb a considerable portion of the mythical million at our disposal.

After the grounds have been selected and laid out and the sheds built, machines could be purchased. If the number owned by foreign countries be comparable, we should require at least five hundred during the year to bring us even to a one-power standard, and then we should be by no means on an equality owing to the almost entire lack of useful experience on the part of our pilots.

A difficulty at the present moment from the Army point of view is the existence of so many varying types of machines, mostly of considerable excellence but with their different points of virtue frequently overlapping.

As in the case of guns, it would be well if these different forms of machines could be reduced in number to a definite series of standard types, each with its peculiar uses in the art of war. Absolute interchangeability of parts and uniformity of size increase to an almost incredible degree the value of such machines to an army on the march, to which questions of repair and transport are of the utmost importance.

A large number of motor wagons and trailers for transport is needed, and this forms another considerable item in the initial outlay. The number of vehicles required to move even three hundred aeroplanes and spare parts is by no means small, and neither is the expense of maintenance thereof a thing to be ignored.

The necessary increases of pay to pilots and observers will absorb only a small amount of money, and the payment of the permanent staff will be a matter of little moment. The erection of a central repair factory or the alteration of the Aircraft Factory at Aldershot to a state of useful activity would again cost a fairly large sum.

Petrol and oil cannot be obtained for nothing by a Government department, and even civilian aviators of distinction will find it difficult in the future to beguile innocent firms into giving them unlimited supplies of fuel in return for glowing letters of advertisement.

In conclusion it is obvious that there are countless ways in which to spend the £1,000,000 which the War Office do not intend to include in the Estimates, and that there are countless possible ways of misdirected expenditure. The spending of the money will present almost as many difficulties as the obtaining of it.

A Day at Farnborough.

By P. K. TURNER.

I had gone down, really, to see Cody go for a passenger height record, and also to see him do some flying with four passengers. As events fell out, I saw neither: other excitements were in store. The first thing that struck me about Farnborough was that the roads were vile for cycling—the journey to Laffan's Plain was an ordeal like the search for the Holy Grail. But when I got off the road on to Laffan's Plain itself I saw that what I had gone through was as nothing; and I began to realise the true inwardness of Cody's chassis. However, I got to the shed at last, and was rewarded with the solution of a puzzle. I had been wondering for half a mile or more whose Blériot was standing in front of the shed, and on my arrival discovered that it was a spare pair of Cody's elevators lying on the ground—they were just about the right size for ordinary monoplane wings!

Cody's machine was being titivated, ready for work; for it must be remembered that it has to be partly dismantled every time it goes into its shed. As in everything else, Cody is original in his hangarage. The machine he is using is his old *Cathedral* of 1909, into which he has at last put the size of engine for which it was designed—a 100-120 h.p., an Austro-Daimler at the moment. It has the disadvantage that he cannot take a sharp turn with the engine all out, because the rudders would probably be blown off. As a matter of fact, he stripped the fabric of his large single rudder some days ago, so had put on the twin rudders off the small "Circuit" machine.

When the machine is to be enhangared, the cross wires from rudder to rudder are removed by undoing six bolts, and the two outriggers are swung outwards. Then a hook on each outside rear wing strut engages a bolt on its corresponding rudder, and the machine is reduced to about half its normal length. The main outrigger stays and the rudder control wires are not touched.

There are a pair of simple rails which run out of the hangar door, and a trolley runs on them. The machine is pushed on to the trolley, and is slid bodily sideways into the shed.

While I was examining the new engine, a faint and pleasant purr was borne upon the mist. It gradually increased, and presently I was able to pick out the new Army Aircraft machine. I had heard that the Wolseley engine on it was one of the first that the firm had built. It has evidently been splendidly tuned, for its note is beautifully even. I thought at first this evenness was due to distance, for it was fully half a mile off. But later Mr. de Havilland landed by Cody's hangar, and close at hand one could tell in what excellent trim was the engine. The new machine is, without prejudice, very nice indeed. [But we were told it was silent. Half a mile seems a good distance at which to hear an engine.—Ed.]

Her chief and outstanding originality, of course, is the marvellous number of different machines which resemble her different parts: Bréguet body and engine housing, Blériot planes with Cody struts, and a Nieuport tail with Flanders rudder, may all be found, with others. *Pace* the daily Press, the automatic warp is not, and the silencers don't—at least, the Martin-Handasyde, let alone other machines, needs less lateral control, and Mr. Spottiswoode's 1910 *Avis* was much less noisy, though it has no attempt at a silencer.

In fact, without being a "little step in advance" of, or even quite as good as, the best machines of the day, it is, in all good faith, a very excellent machine, and its construction is beyond reproach. The side elevation, on page 106, which is not to scale, gives some idea of its general lines. The chassis has two wheels and a cross axle. The propeller is not really a four-bladed one, for it is composed of two distinct propellers crossed on the one shaft. One of the really important points about the machine is the fact that it is fitted with a Dines type air speedometer, the air pressure being observed by a neat little device affixed to the front outside wing-strut, so as to be clear of the slip-stream.

This device is similar to the stationary instruments. The speed through the air governs the pressure in the longer tube, which faces the direction of flight, while the short outer tube shows the normal pressure. The two small tubes lead away to the pilot's seat, where the recording apparatus is placed. The control is by foot rudder and universal lever, the latter being fitted with a rounded disc hand-grip at the top. The planes are slightly staggered backwards, the struts being about at right angles to the chord.

Mr. de Havilland stayed to chat for about ten minutes, the engine running very nicely at about 200 r.p.m. Then he got up again, and did some very nice flying. The machine appears to handle splendidly, although it has not as yet been used for any fancy flying.

Shortly after it had departed we heard the familiar sound of a Gnôme, and the de Havilland biplane passed over. In its latest form this machine is very bad. It is hard to say which is worst: to have a non-lifting tail, with the pilot ten feet or so ahead of the planes, or to keep a heavy load on the tail and have the pilot only about four feet ahead, as in this machine. However, no claims have been made for this machine's modernity, so no more need be said.

After Mr. de Havilland's departure in the new machine, Cody told me that they had arranged a comparative speed test, the two machines to be started side by side from the Aircraft Factory ground, and to fly straight for Cody's shed, a distance of about one and a half miles, each carrying a passenger.

About eleven o'clock Cody's machine was ready for flying, and a deafening racket announced that the big engine had decided to go. Cody also decided to go, so after a short trial run he stopped the engine, got in and restarted from the switch, ran the machine round to face the open plain, and let her out. A 65-yard run got her up to speed, and then—I gasped! I have seen some rapid climbing on one machine and another, and I have observed with discomfort the staircase method as applied to 50-h.p. Blériots. Cody's ascent was quite steady, but it was at about the angle of the steepest part of the usual "staircase." He meandered hither and thither over the plain, making wonderful turns, and finally opening out on the level, and attaining a speed which I guessed at about

68 m.p.h. Having shown what she could do, he came down, and then took me up for a promised "joy-ride."

There are certainly conditions of greater physical comfort than flying fast through a Scotch mist; but one ceases to bother about that after a few moments, and then one can look up and take notice. The first noticeable point was that Cody took both hands from the control, the only effect being that the machine at once began to climb gently. Then he brought her down again, and displayed his usual marvellous judgment of distance by a mile or so at about five feet high, following the contour of the ground.

Then he said: "Now I'll show you," and pulled back the *cloche*, at the same time opening out full (*i.e.*, from 1,200 to 1,400 r.p.m.). The result was extraordinary. I have often felt the effect of fully elevating on an ordinary machine—a sensation like climbing a gentle slope in a car, and a certain loss of speed—but this was quite different. The machine simply ***leapt*** **upward** ***and forward:*** it was like pressing the button of a diagonal lift.

After this he started to show me a Cody *virage:* we followed weird serpentine curves, and finished by a descending spiral worthy of a *première danseuse.*

Then we landed, and I found myself so paralysed with cold that I couldn't hold a cigarette, much less light it nonchalantly, as recommended in "The Compleat Aviator" (Rupert Turnhame-Green and Others, 6s.).

About one o'clock Mr. Harold Perrin, who had come down to observe the height record, advised Cody to go and see if the Factory were ready for the race. He flew over, and in a few minutes returned, saying that he had fixed it for two o'clock, both machines to carry a passenger. So we went to lunch, collecting on our way Mr. Cockburn, who had arrived mysteriously from nowhere. At five to two we returned: Cody flew to the Factory, and we took up our stand to observe the finish. We waited some minutes in a strong cold rain, and then heard Cody coming. He flew over the winning line, and was followed by the Factory machine exactly 12 seconds later.

The Factory machine has been carefully timed on several occasions, and is known to do just about 60 m.p.h.; so that the 120-h.p. Cody does 69 *miles per hour,* and can give the other 230 yards, or 8 seconds, in a mile.

Cody's landing after the race was a marvellous exhibition of constructional strength. He is hardly used to the increased speed of the machine, and when he touched saw that he might hit the shed, so he ruddered hard to the left, going full speed on the ground. I went afterwards and examined the marks. For 65 yards there was a rut 7 in. by 7 in. deep, cut by the skid, and one 3 in. by 4 in. deep cut by the wheel on the wing-tip, and 12 yards away on one side I picked up a large piece of turf thrown off by the propeller—but nothing was damaged.

After that I thought my mind was about full, and as the mist was too thick for further flying, we adjourned. Having shown me what he could do with a two-year-old machine when it had the engine for which it was designed, he showed me some of his new designs and schemes. I think there will be more Cody surprises soon.

Altogether a good day's work. It is something to say that one was in at the first air-race, with a neck-and-neck start, instead of the usual time trial.

In the light of this latest Cody exploit, a *resumé* of his earlier performances is interesting:—

1908.—September 28th. First short flights.
,, October 4th. 493 yards (English record).
1909.—February. 580 yards.
,, June. 1,900 yards, before the then Prince and Princess of Wales.
,, July. 7 miles.
,, August. 12 miles.
,, September. 47 miles across-country (World's Record).
1910.—Three Michelin flights: 97, 114, and 187 miles.
1911.—Four times contracted to attend at various aerodromes at stated day and time. Fulfilled each time.
,, "Circuit of Britain": Only British machine to finish.
,, Won both Michelin competitions, 125 and 262 miles.
1912.—As noted in above article.

Another Success for Mr. Cody.

On Saturday, 27th, Mr. Cody scored another success, by carrying five persons on an aeroplane for the first time in Great Britain. The passengers were Miss Buckoke, 110 lb.; Mr. Hayes, 135 lb.; Mr. Dackett, 155 lb.; and Mr. Frank Cody, 124 lb. Mr. S. F. Cody himself weighs well over 215 lb., so the total weight was just on 53 stone. The machine made two flights of about 3½ miles each, keeping fairly low at first, for the benefit of a cinematograph operator, and later going up to between 150 ft. and 200 ft. It lifted easily in about 60 yards, with the 120-h.p. Austro-Daimler doing 1,250 r.p.m.

Mr. Cody's Landing Ability.

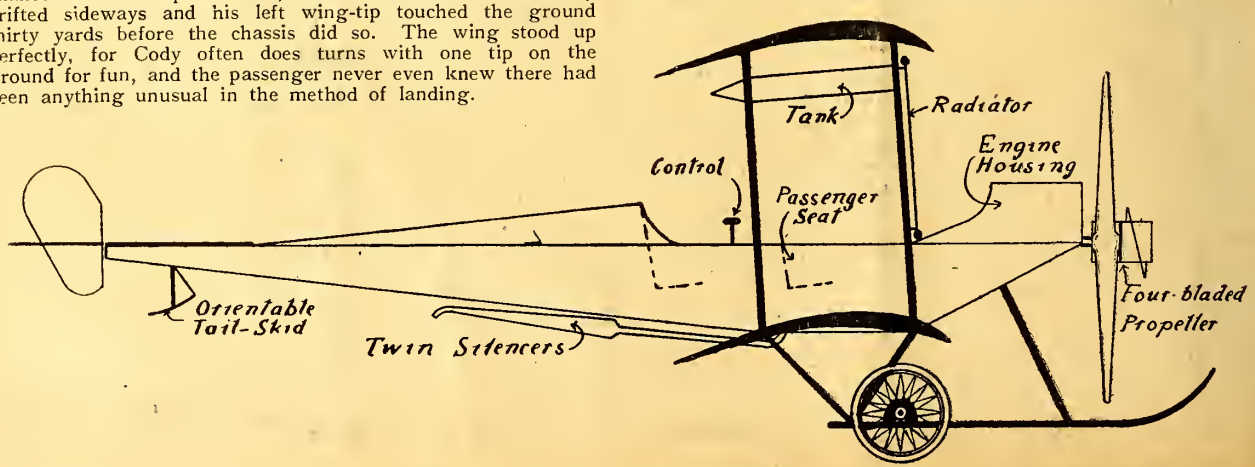
As usual, the daily Press misreported Mr. Cody's little incident of ten days ago. So far from having a smash, he made a perfectly harmless and very clever landing. The facts are that he was flying with a lady passenger in a thick fog, and had started to glide down with the wind behind when he found himself driving into one of the clumps of trees which constitute most of the Farnborough "aerodrome." His only chance was a sharp left turn, but as he turned he naturally drifted sideways and his left wing-tip touched the ground thirty yards before the chassis did so. The wing stood up perfectly, for Cody often does turns with one tip on the ground for fun, and the passenger never even knew there had been anything unusual in the method of landing.

Another "Factory" Biplane.

The first tractor-screw biplane turned out by the Army Aircraft Factory having been comparatively successful, it is interesting to note that another is expected out in a day or two. This machine is very similar to the first, but is fitted with a Renault engine. It had in its original form a chassis of unconventional design, which, however, was condemned by the practical members of the staff, and has now been replaced by a chassis similar to that on the first of the type.

It will be observed by those who have followed the manœuvres of the authorities that, despite the protestations of the superintendent of the Factory and of Colonel Seely that the Government wishes to support British manufacturers, the Factory has turned out three machines for the Air Battalion and four foreign-built machines have been bought; while in the same period two machines, and two only, have been ordered from one British manufacturer, and that delivery of these has not yet been taken.

While The Aeroplane has no politics, or rather is of all political creeds, it must be confessed that this method of equipping our forces is carrying Government Ownership of Sources of Production, and Free Trade, to an extreme.



Diagrammatic Sketch of the Aircraft Factory's first success, described in the accompanying article.

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The Week's Work.

Monday, January 22nd.

Brooklands.—Pizey out with Capt. Weeding, but weather gusty, and no one else doing anything.

Hendon.—Pupils of W. H. Ewen School practising. Capt. Loraine quickly mastering Blériot and MM. Baumann and Dubois making good straights.

The Plain (Air Battalion).—Despite rough day Lieuts. Manisty and Fox put in couple of flights each on Bristol biplanes.

The Plain.—Five Bristol pupils doing solos. Lieut. Murray six flights in preparation for brevêt, Lieut. Brodigan up three times, Lieut. Ashton twice, Mr. Smith-Barry (ex-pupil) twice, and Bendall four times. Jullerot made four flights and Fleming two, taking Lieut. Ashton as passenger.

Tuesday, January 23rd.

Brooklands.—Pizey up with Merriam, but Gnôme troubles soon stopped them. Then up with Capt. Weeding.

At Deperdussin School Capt. Fulton, of the Air Battalion, training on taxi preparatory to flying new Army two-seater.

Hendon.—At Grahame-White School climatic conditions unfavourable for flying, pupils receive theoretical instruction.

The Plain (Air Battalion).—Capt. Fulton being away at Brooklands, Lieut. Barrington-Kennett went up to test air. Flew for 20 minutes. Too rough for more.

The Plain.—Fleming one flight, but weather too bad for more.

Wednesday, January 24th.

Brooklands.—In afternoon Merriam on Bristol doing excellent right and left turns at 150 ft. Pizey up with Capt. Weeding.

Kemp out on *Vickers III*, testing effect of new wings on lateral stability, and later testing rebuilt Flanders.

Herbert Spencer flying well on own make biplane.

At Deperdussin School Mr. Gill rolling on taxi.

Setti did straights on Avro-Green.

Eastchurch.—Engineer-Lieut. Randell, R.N., doing straight flights on the Short *No. 38*, with considerable skill for beginner, landings very well managed. Lieut. L'Estrange-Malone, R.N., latest naval pupil to arrive, for passenger flights with Lieut. Gregory, R.N., on Short triple-twin.

Hendon.—At W. H. Ewen School, pupils all out, Capt. Loraine getting good control in straights. W. H. Ewen put up a good flight of ½ hour on 28 "Dep.," going round by Edgware and Old Hendon.

At Blériot School Messrs. Allen, Parr, Desoutter and Prenssiel only waiting fine day to take certificates, doing excellent circuits (and landing *en vol plané* in professional style), Messrs. Clappen, Pothet, Welburn, and Morris making good straight lines, and starting to get off ground.

At A.S.L. School Mr. Barber out on *Valkyrie II*, flying circuits in excellent style.

At Grahame-White School very windy. Pupils engaged in workshops.

The Plain (Air Battalion).—Lieut. Barrington-Kennett up on his old mount, *F.8.*, taking up as passengers Staff-Sergeant Wilson and Sappers Lewes and Geard. Meanwhile Lieut. Fox did brevêt tests, concluding with a splendid glide from 500 ft. Lieut. Manisty, flying on Lieut. Reynolds' biplane, taking as passenger Sapper Breading. Lieut. Conner giving fine exhibition on Bristol, but on landing ran into shed, smashing elevator and one plane. Later Lieut. Conner brought out Blériot and did short flights until dusk, while Lieut. Barrington-Kennett on Nieuport had half-hour's spin round Bulford and Tidworth, with Corpl. Ridd as passenger.

The Plain.—Fleming for trial on Bristol, afterwards taking Mr. McLeod (Australian visitor) and Mr. Roger Harrison as passengers. Lieut. Murray two flights, and afterwards passed tests for brevêt, observed by Lieut. Hynes and Lieut. Conner. Jullerot took Captain Gilbert, of Italian Army, to Shrewton on biplane, and then took Mr. Roger Harrison for lessons. Captain Gilbert did two good flights on biplane *No. 66*, after which Harrison took up Mr. Roger Harrison, and Bendall finished with solo.

Thursday, January 25th.

Brooklands.—Pizey up with Merriam, but more Gnôme troubles. Later with Capt. Weeding. Merriam did very good figure of 8 at 150 ft. Capt. Weeding then for first solo, and after practice did six good landings. Later Pizey up with Nesham, latter in control. Then Nesham for first solos, doing well. Pizey up with Lane, but stopped by Gnôme valve going.

Kemp out testing Flanders monoplane, but motor not yet tuned up. Knight doing straights on *Vickers II.*

Herbert Spencer up with passengers, and flying most of afternoon.

At Deperdussin School Captain Fulton of Air Battalion doing straights on brevêt machine. Mr. "Partridge" on taxi.

At Deperdussin School Sabelli took certificate in excellent style, doing first tests at 150 ft., making very small figures of 8; and second test at 125 ft., finally climbing to 200 ft., and doing the gliding test with engine stopped from that height. Like nearly all Italians, Sabelli is a fearless flier, and with further practice should be very good across country.

Young out on Avro-Green.

Brighton-Shoreham.—Kent rolling on Blériot. Chanter testing new machine Nieuport type. England testing new Green engine. Mr. Lawrence rolling on Blackburn monoplane. —C. A. C. Winchester.

Eastchurch.—Captain Gordon, R.M.L.I., made exceptionlaly fine flight in very strong wind, and although unusually "bumpy," he remained up for 1½ hours, coming down nearly frozen but satisfied with valuable practice in rough flying.

Hendon.—Big day's work at W. H. Ewen School; pupils out from 9.30 a.m. till dark. Baumann, Dubois, and Warren all making confident flights. Capt. Loraine quite mastered the Blériot, feeling perfectly at home in air. Ewen gave several fine exhibitions with 28 school Deperdussin, making in all six flights. Total time in air exceeded two hours, and most of time flying at 800 ft., becoming acquainted with surrounding country by passing near Canon's Park and Elstree, Finchley and Hendon, and finishing with very fine spiral glides in most cases. In one flight Ewen did straight at 200 ft. with hands above his head.

At A.S.L. School Mr. Ridley-Prentice flying circuits on Green-engined Valkyrie at 200 ft. A.S.L. Works busy testing various propellers on the *Viking*.

At Grahame-White School pupils out from morning till dusk, three of School machines doing continuous work; most of pupils present morning and afternoon. Mr. Lewis Turner started day's work on Biplane No. 2, followed by Biard doing good straights on No. 3. Fowler doing circuits on same machine but had to descend through ignition troubles. Turner then took up machine for test, found engine running well, so turned it over to Raphaite for rolling practice. During day machine used for straights by Lieut. Stopford, Major Liles, and Biard. Fowler and Turner also had Biplane No. 1 out, former making straights and Turner testing engine and making circuits at intervals. In afternoon Turner out on No. 2, taking up in turn Major Liles, Lieut. Stopford, Biard and Fowler for instruction in making right and left-hand turns.

The Plain (Air Battalion).—Lieut. Barrington-Kennett up for 20 minutes, afterwards taking Corpl. Jones for a trip. Lieut. Mainisty doing long circuits for 50 minutes. Lieut. Fox out all morning, doing about 2½ hours flying.

The Plain.—Fleming for trial. Jullerot took Mr. Roger Harrison, and Capt. Gilbert did another good flight. Bendall made one solo, and Prier put up fine flight on new military monoplane.

Friday, January 26th.

Brooklands.—Bad day, windy and wet. Nothing doing.

Hendon.—At Grahame-White School theoretical instruction only.

Saturday, January 27th.

Brooklands.—"Partridge" on Deperdussin out rolling. Still windy.

The Plain (Air Battalion).—Very windy in morning, but Lieut. Barrington-Kennett snatched 10 minutes in afternoon.

Brighton-Shoreham.—Lawrence out on Blackburn monoplane, doing useful rolling practice. This same machine Hucks had been flying during latter part of last year, and loaned to Lawrence until his new military type machine is ready.

Freshfield.—After succession of gales and storms Planes, Ltd., continued experiments with new monoplane, with Fenwick up. Machine gives indications of being complete success. 100 miles during week without trouble, while starting and landing tests show entire machine well up to work. Up to present trials as far as possible secret, but more will be heard of machine in future.

Hendon.—At Grahame-White School wind gusty, nothing doing.

Sunday, January 28th.

Brooklands.—Beautiful day, hard frost, and fog in morning. Lieut. Beatty, R.E., on *Vickers II,* doing good straights in fog. *Parsival I* out all day, suffering from carburettor trouble.

Pizey on Bristol up with all six pupils, and later with Mrs. C. G. Grey for long flight over flood area, doing fancy turns and banks. Capt. Weeding flying well, doing turns outside track towards Byfleet.

Mr. T. O. M. Sopwith out for first time in England on Blériot, the No. 35 70-h.p. American prize-winner, terrifically fast, and wonderful climber. Apparently non-lifting tail has given added speed. His banked turns and fancy glides are distinctly an added attraction for Brooklands.

Mr. "Partridge" on Deperdussin taxi doing straights in excellent style, and then one startling turn on a wing-tip.

During afternoon Mr. Sopwith took up as passengers on the Blériot Messrs. Pizey, Lang, and Charteris, and a lady passenger. Mr. Gustav Hamel then took same machine and went up to over 2,000 ft., giving magnificent display, which was followed by wonderful exhibition of trick flying by Mr. Sopwith alone.

Kemp on Flanders monoplane, getting rather more power and showing how beautifully machine will fly when engine properly tuned up. Hunter on Humphreys monoplane broke propeller in ice on flood-water. Herbert Spencer flying well.

Splendid flying all afternoon in bright sunlight without a breath of wind, altogether reminiscent of best days of early last year. Mrs. Billing at *Blue Bird* kept unusually busy, and it is to be hoped that visitors to Brooklands will in future patronise her excellent restaurant, where one can lunch and tea at half hotel prices and generally get better provender.

Eastchurch.—Clear blue sky, with scarcely breath of wind. Mr. Alec Ogilvie out early on N.E.C.-Wright, flying at intervals all day, and making interesting glides, one especially at very flat angle with engine stopped. Number of London Territorial Balloon Co. down for week-end, in charge of Second-Lieuts. Cockerell and Barrington-Kennett, and under excellent tutelage of Mr. Travers, did good work. Passengers who made first flight were Sapper Meredith for 10 mins. with Mr. Travers, and Driver Brewer with Lieut. Cockerell. Lieut. Barrington-Kennett did long flight on the Short *No. 32,* with some neat banking. Jezzi biplane, piloted by designer, going very strong indeed; Mr. Jezzi, by very careful adjustment of motor, having succeeded in increasing propeller speed by nearly 100 revs., made noticeable difference in speed and climbing power.

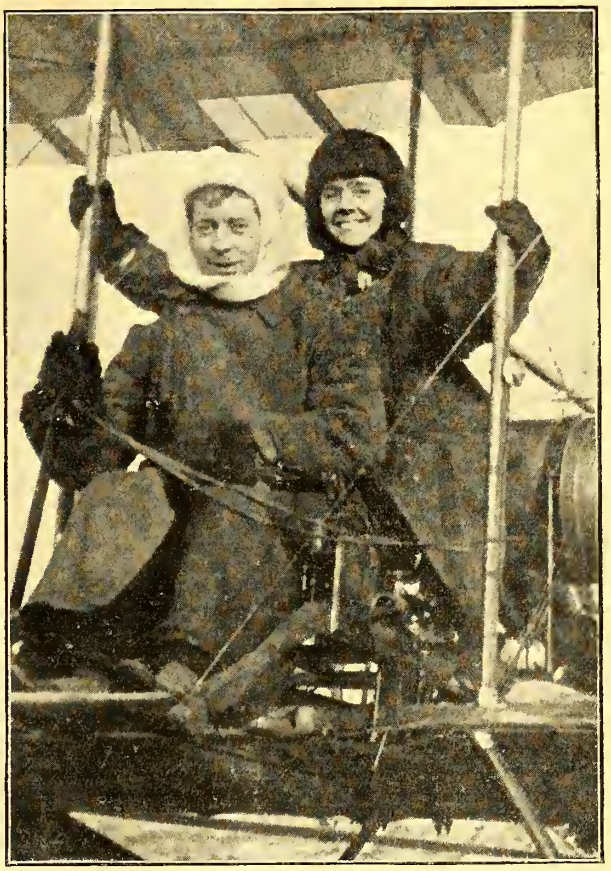
Hendon.—At W. H. Ewen School pupils again put in full day's practice, showing results of hard work. In 8 to 10 m.p.h. wind Baumann and Dubois flying steadily on Blériot. Capt. Loraine and W. T. Warren making very good turns on same machine at 20 and 30 ft. Mr. E. H. Lawford also getting quite happy. Fine exhibition by Ewen, who went up to nearly 1,000 ft., made some fine banked turns, and then executed splendid spiral glide. Capt. Loraine and W. T. Warren both "promoted" to Deperdussin, and made two fine straight flights with nice landings. To finish magnificent day's work, Ewen made another 20-minute flight on Deperdussin, in which he surpassed anything he has yet attempted at Hendon. Flying as if behind engine of double power, he climbed rapidly, making exceptionally sharp turns, dived, and banking at almost alarming angles.

At A.S.L. School Mr. Barber flying new biplane *Viking I,* with new A.S.L. tractors, at several hundred feet doing very small circuits. Very interesting test made with straight fabric balancing planes; these found to be nothing like so efficient as patent cambering balancers designed for machine, and latter system replaced, its wonderful efficiency having been amply proved. Mr. Barber terminated day's work with splendid flight of 20 mins., making very sharp turns with fine banking, final glide from 200 ft. being very effective.

At Grahame-White School Turner and Gates out early on Biplane No. 1 for couple of hours, Turner making fine circuits and Gates straights with good landings. Graham Gilmour arrived during the afternoon, and taking out Martin-Handasyde monoplane, made some splendid flights, banking in fine fashion.

Brighton-Shoreham.—Hucks on Blackburn made fine flights across country, taking Mr. Blackburn on one for passenger trip. Hucks flying greater part of day. Wind blowing steadily about 15 m.p.h.

Ross out on 25-h.p. Anzani-Blériot, and Collyer-England rolling.—C. A. C. Winchester.



Winter Flying Kit.—Mr. Collyns Pizey and a passenger at Brooklands on Sunday last.

The Plain (Air Battalion).—Capt. Fulton, now returned, out on Bristol *F.8.*, followed by Lieut. Barrington-Kennett on same. Meanwhile Lieut. Manisty up for 1 hour doing circuits round aerodrome. M. Prier testing Bristol military monoplane prior to handing over to Air Battalion. Lieut. Reynolds is to fly this machine. In afternoon Lieut. Barrington-Kennett and Lieut. Manisty up on old *F.8.* Afterwards Capt. Fulton testing two-seater Deperdussin, whilst Lieut. Barrington-Kennett took Nieuport out for 1 hour's spin, reaching 3,000 ft. and finishing with a beautiful glide. The military Bristol monoplane on test did 60½ m.p.h. with passenger and full load of fuel, climbing 1,000 ft. in 5 mins. and 2,000 ft. in 11 mins.

The Aeronautical Society.

Notice is hereby given that on and after February 8th, 1912, the offices of the society will be removed to Albion Chambers, 11, Adam Street, Adelphi, W.C.—T. O'B. Hubbard, Sec.

The Polytechnic Aero Club.

A preliminary meeting was held on January 12th, and the first general meeting on January 19th, at the Polytechnic, Regent Street. Messrs. B. Graham Wood, R. Carline, M. B. Ross, W. Birkinger, Fairfax, and W. H. Emerton were elected to form a Committee, Mr. R. Carline being Hon. Treasurer and Mr. H. Emerton Hon. Sec. The Club has secured the services of Mr. L. Blin Desbleds as Technical Adviser, and Mr. B. Graham Wood has consented to act as Designer and Chief Pilot. Professor Harry J. Spooner, C.E., etc., has consented to be Vice-President.

The Club has already commenced the monoplane glider designed by Mr. Wood, and it will probably be completed early in March. Subscription, 10s. For a limited period "working members" will be admitted at 5s. each, but are liable to a further call of 5s.

Anyone interested can obtain further particulars from Wm. H. Emerton, Hon. Sec., 17, Glenthorne Road, New Southgate, N.

The Chinese Army and Aviation.

For some time past two officers of the Chinese Imperial Army have been learning to fly at the Etrich school at Wiener Neustadt. Four Etrichs have been purchased hy the Chinese Government, two of which, in the charge of one of the beforementioned officers, left for China on January 24th. The remaining officer will wait in Austria until the other two machines are ready, when he, too, will return to China. If the Chinese Republican Forces succeed in founding a stable Government, it is rumoured that they also intend to buy large numbers of machines with the intention of forming an efficient air corps. As the Chinese Army is, if a Republic be founded, to be trainod by European officers, the future of military aviation in China is promising.—W. E. de B. W.

French Naval Aeronautics.

During the last week the General Staff of the French Navy has held various meetings under the presidency of Vice-Admiral Auvert, to consider the scheme devised by Captain Daveluy for the formation of a naval air corps. It is proposed to purchase land at Fréjus on which to lay down an aerodrome. The *Foudre* is to be fitted as a parent ship for the aviation force at sea, and an aeroplane *type canard*, presumably a Voisin, is to be installed. Neither the number of aeroplanes to be purchased nor the general plan to be followed is published.

Again, it is the progress of Germany in these matters that has driven France to take some steps to train an air corps for the Navy. The German Navy has at Dantzig a large, well-fitted aerodrome and a small number of highly efficient aeroplanes. In charge are three officers of post rank, an engineer, and seven aviator-officers, the whole force being under the immediate command of Admiral Prince Henry of Prussia. Even the feeble efforts of the United States of America and of Great Britain in the construction of hydro-aeroplanes have aroused envious comment in France. A feeling of discontent at the state of affairs and of annoyance at the fact that France no longer leads to the overwhelming extent of a few months back, has shown itself in the public prints. The result of the recent agitation is that M. Delcassé, Minister of Marine, who has, moreover, the true interests of aviation at heart, has definitely decided to apply to the Chamber of Deputies for a supplementary grant of 1,100,000 francs (£44,000) to be devoted to the furtherance of naval aviation during this year.

W. E. de B. W.

French Military Aviation.

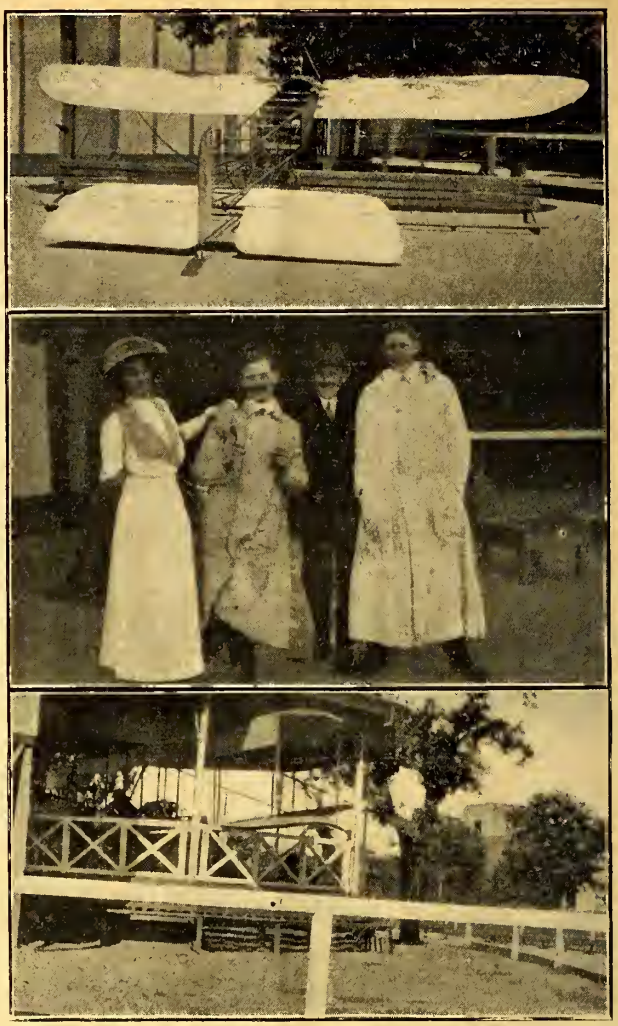
The efficiency of French Government is chiefly maintained by a rapid series of ministries which, during their brief periods of office, act with the precision and thoroughness of new brooms. Each Ministry in turn has some subject to which it devotes a considerable portion of its time and a large sum of the country's money. One Government favours railroads, others improve the Navy or the Army, and so on. The favoured subject of the moment is aviation, and both MM. Millerand and Delcassé intend to further its interests so far as possible in their respective Ministries of War and Marine. The money grants have already been discussed. The first sign of increased expenditure is the creation of aviation camps at Fez and Casablanca, under the supreme command of Lieut. Clavenad. He is to have in his command three officers, fifteen mechanics, and four aeroplanes. This force leaves France for Morocco about the middle of February. It will be interesting to watch results.

M. Millerand proposes to form a small regiment of aviators at once, and further regiments as the number of aeroplanes on service increases. This plan apparently has been approved by the French President. The existing six aviation companies will form the nucleus of the new regimcnt. Three hundred and twenty-eight monoplanes and biplanes are to be ordered at once, for delivery towards the end of the year. Innumerable sheds are to be erected in all parts of the country, and each military camp and garrison will have its aviation ground. It will be interesting to observe the organisation finally adopted. Military aviation even in France is still in a nebulous condition, though the immediate future has in it promise of great progress.

W. E. de B. W.

Mr. Sippe's Discontinuation.

On January 28th, Mr. S. V. Sippe, who has been making several flights round Abingdon lately, started from Abingdon to Finchampstead on his way back to Brooklands, but was brought down by a frozen carburettor. In starting afresh from Finchampstead on Monday, he was brought down a mile from that place through the carburettor again failing. The Avro was wrecked, but Mr. Sippe escaped unhurt. This is the machine on which Lieut. Parke, R.N., flew to Abingdon a week or two ago.



In South Africa.—Mr. Driver's Blériot and Mr. Compton Paterson's biplane in unusual surroundings. In the centre are Mrs. Livingstone, and Messrs. Paterson, Livingstone, and Driver.

From Rhodesia.

From Amajoda, Bulawayo, Mr. A. R. Howe-Browne writes: "Driver was on board coming out. He and Mr. Paterson were most energetic in getting their machines together in the 'Good Hope Gardens,' where they exhibited them.

"They have done very well so far, Driver making long trial flights and getting up to 2,500 ft.; Paterson rose to 3,700 ft. last Wednesday (December 27th), and flew 16 miles in 19½ minutes (according to the Bulawayo paper).

"Driver says that Paterson's machine will easily lift two passengers at Cape Town, and probably three when the engine is running better.

"They are coming up here in March, I think. I was sorry to see in to-day's paper that Paterson was upset at 34 ft. up by a gust, and sustained a severe shock, wrecking his machine.

"I enclose some photos. I took them at 'Good Hope Gardens.' Paterson kept his machine in the bandstand."

Progress on the Continent.

There would seem to be a season for the breaking of records, a season which is at its height at present. Several world's records have been broken during the last fortnight, and each day's paper brings further news of the surpassing of some feat of the past.

Record breaking is a comparatively modern craze. One cannot remember having heard of Noah claiming a world's record for duration of drifting during the heavy floods of his days. If in the future the craze spreads we may expect someone to claim credit for having flown the longest distance minus a cylinder of his engine.

There are, however, certain records, the attaining of which is of considerable use in the development of the new science, and of these are the performances of Tabuteau.

He flew on a Morane monoplane (50-h.p. Gnôme motor) for over three hours, covering 320 kilometres and creating the following new records.

New Records.	H.	M.	S.	Old Records.	H.	M.	S.
200 kil.	1	54	21	Aubrun ...	2	18	30
250 ,, ...	2	22	57	Bournique	3	4	28
300 ,, ...	2	51	41	,,	3	40	55
2 hours covering 205 kil. 287 m.				Aubrun ... 167 kil., 500 m.			
3 ,, ,, 316 kil., 287 m.				,, ... 252 kil., 500 m.			

The Deperdussin monoplane continues its series of records. On the afternoon of January 22nd, Prevost, on a 100-h.p. Deperdussin monoplane and accompanied by Lieut. Brat and M. Besnard, rose to a height of 2,200 metres, thus beating by 1,000 metres the record made in September last at Wiener Neustadt by Lieut. Bier (Austrian Army Reserve). Verrept's high flight of last week was claimed as a world's record, whereas it was merely the *French record*. Prevost in his record flight of Monday took exactly half an hour to reach the greatest height attained and eight minutes to return to earth again. The Deperdussin monoplane now holds the height records with one, two, four, and five passengers, as well as the speed and distance hour record gained by Védrines.

At Johannisthal Aerodrome, near Berlin, on January 22nd, the aviator Grulich flew for 2 h. 2 m. 45 s. on a Harlan monoplane, accompanied by two passengers. The previous record was held by Lieut. T. de W. Milling, who flew in America on November 14th, 1911, for 1 h. 54 m. 42 s.

At Douzy, on January 27th, not content with his passenger height record, Bathiat on a 70-h.p. Sommer monoplane, beat certain speed records previously held by Védrines. The following is a list of distances and times :—

	Bathiat.		Védrines.	
	m.	s.	m.	s.
10 kil.	4	8-1/5	4	13-2/5
20 ,, ...	8	13-1/5	8	26-3/5
30 ,, ...	12	25-1/5	12	40-3/5
40 ,, ...	16	33-1/5	16	53
50 ,, ...	20	43-1/5	21	4
100 ,, ...	41	29-3/5	41	56-4/5

The greatest speed attained was about 150 kil. an hour, and the average speed up to 20 kil. was 146 kil., 44 metres an hour, thus beating Védrines' previous record of 145.177 kil.

As there are at this time of the year but few aviation prizes to be contested, and those few of little value, Védrines, in search of money, has turned lecturer. In the lack of other knowledge, he speaks of aviation and of the future progress to be made in that science. On January 26th he delivered his first lecture at Toulouse, whence he flew on the 27th to Castelnaudary, where he again addressed an audience on the subject of flying. In his view, as reported by the French papers, speed and himself will be the making of aviation. There are no limits to his performances, it would seem, and if rudeness and a total ignorance of the rudiments of common courtesy are an ever-ready help he will travel far on the road of success. Marseilles, Lyon and other large towns of France are in turn to be honoured with his advice.

Gibert, the former R.E.P. pilot, who flew so magnificently in the European Circuit, has now got together a syndicate of his own and has blossomed forth as a constructor. His first machine is being built by Régy Frères, and should be out by the time this note appears. It is said to be quite a small monoplane of the "canard" type, with a 30-h.p. Y Anzani engine. The propeller is behind, and it is designed for a speed of 45 m.p.h. In France anything with a small leading plane is called a "canard," though in England you would probably describe it as of Valkyrie type.

Molla continued his series of records on January 27th, when he flew on a Sommer biplane for one hour, accompanied by six passengers (Mm. Puységur, Sergent, Richy, Labelle, Aubry, and Guichard). This feat creates another "world's record."

One Sunday lately Busson, whose Deperdussin is "stabled" at Pau, followed the Pau foxhounds during a 45-minute run. He flew at about 600 ft., and had a fine view of the whole hunt. It is not certain whether he descended in time to be in at the death. Busson, although he has been seriously ill for nearly a year, still holds most of the weight-carrying records, and he may be expected to distinguish himself still further before long.—Pingouin Rose.

The First Associate Fellows of the Aeronautical Society.

As the result of the ballot for the election of the First Associate Fellows, the following have been elected :—H. Barber, Griffith Brewer, Capt. A. D. Carden, R.E., T. W. K. Clarke, J. W. Dunne, R. L. Howard Flanders, Prof. A. K. Huntington, Leo Jezzi, J. H. Ledeboer, Archibald R. Low, W. O. Manning, Mervyn O'Gorman, Alexander Ogilvie, F. Handley Page, Prof. J. E. Petavel, F.R.S., Horace L. Short, Capt. M. F. Sueter, R.N., Lieut. N. F. Usborne, R.N., Lieut. C. M. Waterlow, R.E., E. T. Willows.

It must be confessed that the above result is somewhat extraordinary, and it can only be attributed to the fact that the Aeronautical Society has of late acquired a large number of new members who, while exceedingly keen on aviation, are not altogether in touch with the individuals who are doing scientific work.

For example, among the rejected candidates for Associate-Fellowship are :—Mr. W. R. Turnbull, a Canadian scientist of considerable note; Mr. A. P. Thurston, a mathematician of ability, who has done quite a large amount of serious experimental work, and has also done a good deal of practical work with Sir Hiram Maxim; Mr. H. F. Lloyd, who is Mr. T. W. K. Clarke's right-hand man, and one of the soundest men on detail design and construction in the country; Messrs. Harris Booth, Bramwell and B. M. Jones, all of whom are doing research work at Teddington Laboratory under distinctly adverse conditions; Mr. Ellis Williams, a scientist who has done a large amount of work with Professor Bryan which has resulted in the production of one of the greatest books on the mathematics of aviation; Capt. Burke, who, besides being a qualified aviator, is more than a little of an authority on the science of war, and the application of aviation thereto; Captain Brooke-Popham, who is also a qualified aviator, and a serious scientist, who has done a large amount of work, which, unfortunately, cannot be made public for various reasons; and Mr. E. P. Frost, the late President of the Society, who undoubtedly deserves a Fellowship for the many years of his life he has devoted to research work.

When such men as these are rejected by the members of the Society, which proceeds to elect, as it has done, several men who, in spite of a certain amount of work, have never been associated with anything but abject failures, for which they may, or may not, be personally responsible, it really seems time to suggest either that the members of the Society should meet more frequently in an informal manner, so that they make one another's acquaintance, or that at the next election of Fellows the members should be supplied with a brief summary of the work done for the advancement of aviation by the various candidates. There should certainly be no difficulty in obtaining such information from the nominees of the candidates, and if the cost of publishing these brief election addresses is thought to be too much by the Council of the Society, no doubt the various papers interested in aviation would be glad to find space for it.

Mr. Sopwith's Venture.

The latest move at Brooklands, and a welcome one, is the opening of an aviation school by Mr. T. O. M. Sopwith. He has now got a whole fleet of various machines, and it has struck him that with so great a variety he ought to be able to turn out much better pilots than the man who is confined to one type of machine. His school machines will comprise his old Howard Wright biplane, familiarly known as "the family tank"; his American Wright biplane, a school Blériot, and a Howard Wright monoplane. The two biplanes will be fitted with dual controls, so that the pupil can learn the controls in the air. Mr. Sopwith will also have his 70-h.p. tandem Blériot for his own use, and will, probably, have the Martin-Handasyde to fly as well. With Mr. Sopwith himself as chief instructor, and that prince of engine-tuners, Mr. Sigrist, to keep the machines in order, the pupils at such a school ought never to lack either machines to fly or the best of tuition. To the man who wishes to become a really good all-round flier, Mr. Sopwith's school should appeal at once.

To Prevent Confusion.

During the latter months of 1910 a series of well-informed articles appeared in the aeronautic Press over the signature "Oiseau," this pseudonym covering the identity of Mr. W. E. de B. Whittaker, who was then resident in Paris. To prevent any confusion with similar signatures it may be well to state that Mr. Whittaker's own name now appears on all his contributions to the Press, and these are confined exclusively to The Aeroplane.

"Stability in Aviation."

Under the above title there has just been published a book which, in the writer's estimation, fully merits the title of the only really important work on aviation since Lanchester's "Aerodonetics." The writer, Professor G. H. Bryan, has managed to show his calculations and conclusions within a quite small bulk, but they are extraordinarily interesting.

In his treatment of the problem of stability as a whole, he takes as his fundamental consideration that the machine is in equilibrium, and he examines what, in any particular case, is the result of disturbance of that equilibrium. Obviously, if the oscillations set up are what are known as damped oscillations—*i.e.*, if their amplitude decreases as time goes on, the machine is stable; if the oscillations neither increase nor decrease, the machine is neutral; and if they increase, it is unstable.

Professor Bryan has deduced equations between the various forces acting on a machine at any time during an oscillation, taking into consideration the various arrangements of planes, fins, etc., which are used in practical and possible machines. From these equations it is quite easy for a first-class mathematician to settle definitely whether a particular arrangement gives stability—so easy, in fact, that even an indifferent mathematician like myself can occupy the immortal Watson's position of saying, "How simple!" when the actual results are shown.

He treats first of all the subject of longitudinal stability, and arrives at several very interesting conclusions. These are distinctly worth noting, because some of them are well known to all practical men to be absolutely true, and as those which have not yet been observed are deduced in the same manner from the same premisses, it would naturally seem probable that they also are true. Take, for example, the first of the conclusions at which he arrives from his study of standard equations: "A single plane cannot be stable unless . . . . the centre of pressure moves forward when the angle of attack decreases." This, of course, is well known to all of us, whereas his next dictum is rather startling: "If an aeroplane is stable when the planes are on a level with the centre of gravity, the stability is only very slightly affected by raising or lowering the planes." In this connection, however, it must be noted that he applies the limitations that the planes are narrow and the angle of incidence small, and, further, that the engine is assumed to be running throughout—also, this applies only to longitudinal stability.

Another interesting conclusion is that, subject to the same limitations, "the inclination of the machine to the horizon depends exclusively on the propeller thrust. Increasing this causes the machine to tip up in front, and *vice versa*. The direction of flight is always parallel to the plane of the tail: if this be turned in direction a corresponding change will take place in the direction of flight." From which we see that the only sound way of getting extra speed out of a machine is to raise the tail above the normal, or diminish the angle of incidence, and open the engine out fully.

He also deduces from the same complicated equations the well-known fact that if the stabilising plane is non-lifting, it must be behind the main plane. But the next conclusion is one that has not yet, as far as my memory goes, appeared elsewhere. It is: "If the propeller thrust tends to depress the machine, stability is increased, and *vice versa*," a matter which deserves serious consideration, as it may become very important. It can easily be allowed for in design.

The next statement, however, while equally important, has a much more far-reaching effect on design as a whole: "If an aeroplane is stable when flying horizontally, it would be more stable when descending," and that "a machine rapidly loses its stability when it begins to rise in the air," from which it at once follows that it is not safe to draw inferences as to stability from the behaviour of gliders, which are always descending. A further point must be considered in this connection, since the author definitely states that "a system consisting of a main plane with a tail *and* front elevator can be made much more stable in this particular direction."

Another point is the following: "The main effect of head resistance is to increase . . . . the stability by increasing the 'modulus of decay of the long oscillations,'" the precise meaning of the latter part of the sentence being that a particular and mischievous set of oscillations to which he refers will be damped out more quickly as the head resistance is greater—a matter of very great importance in view of the obviously desirable tendency at the moment to reduce head resistance as far as possible. He states that precisely the same effect is produced by the diminishing propeller thrust when speed is increased.

A matter on which the author goes considerably beyond the work of Lanchester is in his adaptation of his principles to various types of machine. In "Aerodonetics" the assumption throughout was that the machine is of the non-lifting tail type. For the sake of simplicity, Professor Bryan takes up the same point of view, but he also shows how any machine may be expressed in terms of a non-lifting tail machine whose stability resembles it exactly, and whose surface is the same.

In connection with the note above, on the direction of the propeller thrust, it is interesting to note that in the case of horizontal flights, under certain specified conditions of design, stability is increased by lowering the propeller axis, and decreased by raising it. From these two dicta in connection, we see that lowering the propeller axis increases stability, as also does the pointing of the axis in a downward direction. Now either of these will upset the balance of the machine if the engine suddenly fails, but if the propeller shaft is below the centre of resistance, and the propeller axis points downwards, the two effects may be made to cancel in the case of propeller stoppage, whereas both of them increase the longitudinal stability.

After dealing at length with every possible aspect of longitudinal stability, the author passes to the consideration of lateral stability, which he finds to be very much more complicated, and also more difficult to attain.

He deals firstly with the question of lateral stability as obtained by vertical fins, the main planes being rectangular, and without dihedral, and the first conclusion reached is that "for stability the fins must be raised above the centre of gravity," or that "if level with the centre of gravity there must be two fins, one in front of the centre of gravity, and one behind it, the distance between them being large; and that the centre of pressure of the two must be only slightly in advance of the centre of gravity." He next passes to the consideration of planes which are bent up at the tips, or which have a dihedral angle to obtain stability, and he finds that in only a few cases can lateral stability by this means be attained without a vertical fin; but he states that when a vertical fin on the tail is also used, the machine's lateral stability may be made independent of the angle of flight of the machine, so that it does not become unstable when ascending—which would seem to point to the fact that this type of stability, to which he refers as "the Antoinette type," is the best for practical purposes. In connection with it he notes that the intersection of the wings, i.e., their junction with the fuselage, must be above the centre of gravity, but he also notes that if the centre of gravity is too far below, dangerous rolling may be set up—a result which is fully in accordance with practical experience. He finishes the work by short references to and analyses of the various other researches which have been made in the same direction.

Altogether, the book would be absolutely absorbing to a real mathematician. I myself found it of immense interest, although I was many times out of my depth in the maze of symbols. I should be delighted, as a relaxation, to read a book on the same lines written by his deputy-acting-sub-assistant experimenter, which would probably be sufficiently simple to be fully understood by the more highly accomplished of our aero-designers.—P. K. T.

A Nice Variety.

Mr. Maurice Wright, back from Paris, where he had been spending Christmas, spent some time at Juvisy, the best of the aerodromes near Paris, and gives an interesting account of the machines actually there during his visit. He says the Goupy school is apparently the busiest, and has several sheds and machines. De Pischoff, with his low centre of gravity monoplane, has also a school. There are two Caudron biplanes and a Maurice Farman war-plane—in France called an Avion. Champel, who flew at Lanark, has a Henry Farman biplane fitted with Bronislawski ailerons, which in this case have five planes each; the machine has an E.N.V. engine. Barillon has a little monoplane very like a Nieuport. There is a Voisin of the Mahieu type, i.e., minus a front elevator, and this is fitted with two Gnôme engines, one in front and one behind, in the manner originated by Short Bros. P. Levassor has a biplane of Curtiss type. There is also a Demoiselle of doubtful parentage, a mongrel Nieuport, and a genuine Nieuport fitted with a new nameless engine which has six cylinders set fanwise. Altogether a nice little collection

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More Air Battalion Trouble.

Sir,—Referring to the sentence, "One has only to look at the Air Battalion machines which are repaired at the Army Aircraft Factory," etc., etc., in your columns, headed "Notes on the Army Aircraft Factory Biplane."

I find myself at a loss to locate the Air Battalion machines, except the two at Farnborough, which are repaired at the "Factory." As a matter of fact, all repairs to machines are done in the sheds at Salisbury Plain by the sappers, who, of course, are efficient tradesmen, but who have to work under all sorts of silly and absurd restrictions. For instance, the "Aeroplane Section" are not allowed a lathe as they are on detachment—*vide* some fossilised Army Regulations—and when the officer commanding sent to Farnborough for a surface block he was asked what he wanted it for (probably it would have been handy for making pan-cakes or toffee on), while at headquarters at Farnborough they have a lathe and a drilling machine, and various other machine tools, which are highly polished, and kept in oil as ornaments.

The seat of hindrance to the efficient working of the Aeroplane Section, over and above the parsimonious policy of the Government, is the Headquarters Staff at Farnborough and the large body of "Experts" at the Aircraft Factory, who outnumber the actual workmen by about two to one, and enjoy afternoon teas, and do practically no work, their main object being to get their friends or relations a "soft job."

As regards workmanship, I will draw a parallel between the two classes employed in aeronautics by the Government, namely, the Sappers of the Air Battalion, and the Aircraft Factory workmen.

The Sapper is a tradesman who, in a time of unemployment, has been misled by the glib mis-statements of the recruiting sergeant, and enlisted. He is the man who is obliged to do the actual technical work in the Air Battalion, as the average officer has but the slightest knowledge of engineering technique and merely uses the machine as a means of locomotion, as a civilian may learn to fly, or drive a motor-car.

The Sapper gets more often than not, bad food, long hours, and is liable to be bullied by everyone (especially those officers who stay in an office at Farnborough, and who are not only unable to fly, but are of no use as engineers, and, in fact, do nothing to justify their position), and by way of recompense the sapper gets from 10s. to 16s. a week. Whereas the Aircraft Factory employé receives regular tradesman's wages, and facility for good work so far as materials and machinery are concerned. He is subject to practically no annoyance, and as a rule is almost too careful to risk losing a good job.

"Tradesman."

Tuning the 35-h.p. J.A.P.

Sir,—In reply to Mr. Leo Jezzi's letter in the current issue of your paper, I cannot quite understand what Mr. Jezzi means by saying that he does not agree with my view as to the failure of the lubrication. Either he has misunderstood something of mine, or else I misunderstand the first paragraph of his letter. So far as I can see we are quite in agreement on the matter.

The makers of the engine also warned me that if the ports were closed it would lead to the warping and breaking of the exhaust valves, but as I always believed my engine would keep cooler with the ports closed, I did not see how a cooler engine would give more valve trouble. In fact, I expected quite the reverse to be the case, and so far have not proved anything to the contrary.

The makers have informed me that they now make a valve much superior in quality to the old one for these engines.

If this is so, and my old valves have given no trouble, I am quite certain that with the new valves the engine will be thoroughly reliable, and give no trouble even in long runs with the ports closed. The valves which came in my engine are still in it, and since July I have not found it necessary even to look at them.

I have not had a lubrication system fitted to my engine, and therefore have not been able to run it for a longer period than from 12 to 15 minutes, but if it runs so long as this without an oil feed to the crank case, there is no reason why it should not run for any length of time with oil going into it. A good flow of oil into the crank-case is one very good reason why the valves should not give trouble, as a certain amount of it goes out with the exhaust gas, which keeps the valves from getting unduly hot. I am a believer in over-oiling this type of engine, and if the carburettor is set right not the slightest trouble need be expected from dirty plugs.

Over-oiling alone does not make the spark plugs dirty; it is over-oiling in combination with a badly-set carburettor, giving a too rich mixture, which is the cause of spark plug troubles.

I follow Mr. Jezzi's doings and take the greatest interest in his work, and take this opportunity of wishing him every success.

Belfast. Harry Ferguson.

Prehistoric Designs.

Sir,—It is interesting to learn that the archæopteryx (the prehistoric bird mentioned by Dr. Hankin) had claws on its wing-tips. May I venture to disagree with your assumption that they were used as wing-tip skids for bad landings? H. G. Wells mentions a similar device in "The War in the Air," claws being fixed on to the wing-tips of an aeroplane for the purpose of *ripping up the envelopes of dirigibles.*

Was this the way the archæopteryx used his claws? That is to say, was there a yet earlier type of bird—a kind of flying globe-fish—which the more efficient archæopteryx attacked and eventually drove from the air to its present element, water, thus foreshadowing the probable fate of airships?

Personally, I do not think so, as I am (with H. G. W.) a believer in the possibilitics of airships and flying machines as distinguished from aeroplanes, though as I have no money invested in their development I do not worry. Still I can quite believe that the flying balloon fish did exist. If it existed there would be no traces now of its existence, owing to its flimsy construction. *There are no traces.* This may be regarded as the first link in the chain. May I express a hope that Dr. Hankin may be able some day to complete it, as well as enlarge on this interesting subject? Onlooker.

Acetylene Welding.

Sir,—In your description of the A.A. Factory biplane (The Aeroplane, January 25th, p. 90), the rather sweeping statement is made that "acetylene-welded joints are apt to be very treacherous."

I venture to controvert this statement, as it seems to me to be inaccurate, and not at all in accordance with the experience of those firms who have successfully specialised in the application of this process to aeroplane work; such as, for instance, T. W. K. Clarke and Co., and others.

Not having had an opportunity of seeing the new A.A. biplane, I am uncertain as to which particular form of tubular welded joint your criticism may be more especially directed. Since, however, the A.A. Factory has had some considerable experience in acetylene welding, it is reasonable to conclude that the Factory designers have satisfied themselves as to the soundness and reliability of the work.

Much, of course, must always be dependent on the type and thickness of joint. Any joint, whether welded or otherwise, is treacherous, if not properly designed or if badly made. As to thickness, satisfactory results can be obtained down to 1 mm., or even less. In many cases acetylene-welded joints may have proved unreliable, just as instances may have occurred where some English designers have apparently adopted welded joints without much knowledge of the range and limitations of this process, and have failed to specify material of suitable composition for the purpose, and where the constructors have, moreover, permitted the actual welding to be performed by men who were insufficiently trained to deal with such expert work as aeroplane fittings.

The result has been that the metal at or near the weld becomes "burnt" and brittle, or "perished," as the welder would say, and breaks "short," or, as you express it, "partakes more of the nature of cast-iron than of steel." All this, however, does not go to show that good and reliable acetylene welds cannot be made: they have been, and are being, made, and the proof of the welding is seen in the testing.

In welding there are perhaps more "snags" than in most other processes, but provided that the steel is of the right quality, that the welding is done by a skilled operator, and the joint subsequently undergoes adequate heat treatment, or annealing, such welds will display under test a satisfactory drawing down, or extension at the weld, a high strength ratio to that of the body of the plate, and a good fracture showing no traces of

"burning." And, if required, it is easy to make the joint stronger than the solid plate by slightly thickening the weld.

As to naval work, the Admiralty, as you point out, are not favourably inclined towards this process. During war time, however, they would probably be obliged to make extensive use of it.

The other Marine Surveys, such as the Board of Trade and Lloyds, allow urgent repairs to be made by this method, as in marine boiler furnaces, etc., though the repairs must not be in vital spots, and their surveyors do not officially sanction it.

This, however, is only patchwork; the making of aeroplane fittings is, of course, quite a different class of work.

H. F. Lloyd.

A Question as to Banking.

Sir,—Can any readers of The Aeroplane inform me if there is any known way of calculating the maximum angle to which any given aeroplane can be over-banked without a sudden side-slip on a turn of given radius; and whether the angle of excess over the correct banking is a function of the radius? By "correct banking" I mean the angle which makes the resultant of centrifugal and gravitational forces normal to the planes.

Ventre-à-Terre.

A New Departure in Balloons.

Sir,—Ballooning as a sport does not seem to have prospered in this country. Some even say the old gas bag is a thing of the past. This does not appear to be the case on the other side of the Channel, as 1911 has proved a record year for ballooning, 412 ascents being recorded in Paris alone, besides other ascents in different parts of France, so that over 1,000 balloon ascents were probably made in France. Nor is Germany very far behind. Every town of importance in Germany possesses its aeronautical club, so that with competition ballooning gains in popularity. Ballooning as a sport is not expensive. One can acquire a small balloon all in for about £60, and have some hours' run at little cost. In London, for example, a 12,000 cubic ft. balloon can be filled for £1 10s., and another £1 would cover transport and railway fare; or a balloon for two would cost for gas £1 15s., and the expenses would be practically the same.

Also there is a future for the balloon in the field of experiment. This branch of aeronautics has not been very much extended, and it is within possibility to produce a balloon which would not require gas, could be inflated at the cost of a few pence, and make journeys of from two to six hours' duration. There is also the ordinary gas balloon which could be so arranged as to keep in the air for a fortnight.

Some say one has no control over direction, but surely this is what renders the spherical balloon interesting, and you have at all times complete control and can come down when you please.

If you wish direction you have only to take to the dirigible. This branch is not exhausted—far from it. Let any one construct the smallest dirigible possible to take one person and a motor of 50 h.p. With enough petrol to work it for a few hours he would certainly obtain wonderful results.

As regards an ordinary spherical balloon remaining in the air for several days, I will endeavour to give a rough idea of a system I am working upon by means of which the aeronaut would not require ballast, when once he became accustomed to the working of the apparatus.

I will call my system an Aero Montgolfier, and base my calculations on a large balloon capable of raising eight passengers for a journey of six days.

The Aero Montgolfier, with a capacity of 120,000 cubic feet when inflated with hydrogen gas, will raise 8,400 lb., of which over 5,000 can be regarded as ballast. The air ballonette has a capacity of 42,000 cubic ft., which, when inflated with hot air, will raise 6 to 700 lb. The balloon would be constructed with the strongest material obtainable and the least porous for hydrogen. The gas balloon would be completely closed by an automatic hydraulic valve, which outlet would be so situated that no gas would be near the heat generator. The whole balloon would be rendered moisture and rain proof.

The car arrangement would consist of a large platform where eight passengers could be accommodated in comfort, with a lower car for provision, ballast and fuel, which would be used as a sleeping room for four passengers at a time.

The "calorique" is a very ingenious heat producer. It is entirely enclosed in an aluminium funnel and its aperture completely surrounded by gauze wire. The gas balloon is 40 ft. away, while the only valve or gas outlet is nearly 80 ft. away, and when the calorique is working there is no discharge of gas anywhere. Inside the air ballonette there is no outlet of gas whatever. The heat producer, which can be worked at at will, generates from 5,000 to 500,000 calories per hour, while the flame, which is entirely encased, will not be bigger than 14 ins. in diameter by 18 ins. high at its greatest power.

The fuel is heavy oil, only inflammable when vaporised.

It is proposed to carry enough fuel to work the calorique for 70 hours at 500,000 calories, or 650 hours at 5,000 calories, and as the calorique would never be used for more than 15 hours daily, and at all times would only be working at its medium power, the fuel would last for over 250 hours, and would give a run of over 14 days. Therefore if we had control of the temperature of the gas, as well as being able to travel at an even altitude, varying not more than 1,000 to 2,000 ft., the only loss of gas would be through the envelope, which, if we take it at 2½ per cent in 24 hours, would mean approximately less than 3,000 cubic ft. per day. This in 14 days would mean 42,000 cubic ft., or a loss of 2,940 lb. lifting power, which would be compensated by the use of 2,000 lb. of fuel and the remainder as ordinary ballast.

Such a balloon can carry 5,000 lb. of ballast, and the lift of the Montgolfier would be an extra 700 lb. At all times the balloon is kept full by means of the air ballonette.

This shows the possibilities of the system, and it will not be long before it is an accomplished fact; but I propose to publish further details concerning the working arrangement during a journey with such an aerostat.

A. E. Gaudron.

Low Power Experiments.

Sir,—James was not "Wright" when he says I was speaking of "man power" experiments. The last paragraph of my letter was not intended to be taken seriously, but I thought it might have amused someone.

Evidently Mr. Wright is not going to be bothered with a low-powered engine, that is, if he is going to use two 8 ft. propellers, with the necessary gearing, etc. The idea sounds all right, but I think he will find it difficult to make it work in practice. I find one chain drive quite enough to keep in trim, and a short one at that. Anyway, I wish Mr. Wright every success, and he may rest assured that I am not wasting my time on the phantom one man-power machine which he seems to have conjured up in his imagination.

Cheltenham. Harry Higgins.

The Royal Aero Club.

The Annual General Meeting will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

Notices of motion must be received not less than twenty-one days before the meeting, and must be signed by at least five members. Thursday, February 29th, 1912, is the last day for the receipt of notices of motion.

In accordance with the rules, the Committee shall consist of eighteen members. Members are elected to serve for two years, half the Committee retiring annually. Retiring members are eligible for re-election.

The retiring members of the Committee are:—

Ernest C. Bucknall.	Sir Charles D. Rose, Bart., M.P.
Col. J. E. Capper, C.B., R.E.	A. Mortimer Singer.
G. B. Cockburn.	Hon. A. Stanley, M.P.
E. Manville.	R. W. Wallace, K.C.
J. T. C. Moore-Brabazon.	

Any two members of the Club can nominate a member to serve on the Committee, having previously obtained such member's consent. The name of such member so nominated, with the names of his proposer and seconder, must be sent to the Secretary in writing not less than fourteen days before the Annual General Meeting. Thursday, March 7th, is the last day for the receipt of nominations.

Members are reminded that a ballot paper for the election of nine candidates to seats on the Committee of the Club will be forwarded to them at least seven days before the date of the Annual General Meeting.

It was unanimously resolved to award the following medals for the year 1911:—

A Silver Medal to P. Prier (flight London to Paris, April 12th, 1911).

A Silver Medal to James Valentine (performances in *Daily Mail* and European Circuits, June and July, 1911).

A Silver Medal to S. F. Cody (performance in *Daily Mail* Circuit, July, 1911).

An International Aero Exhibition will be held in Berlin from April 3rd to 14th, 1912, particulars of which can be obtained on application to the Secretary, Royal Aero Club, 166, Piccadilly, W.—Harold E. Perrin, Sec.

A Note from the States.

A correspondent writes:—"An American aviator called Fowler has been for several months trying to cross this continent—San Francisco to New York—in a Wright biplane. They start him off from hand-cars and things, and out goes a sparking plug, and down he comes. For the last four days (written January 1st) he has been in a swamp twelve miles from New Orleans, and has now made the 'plucky announcement' (*vide* Daily Press) that he'll come to New Orleans to-day, *even if he has to come by train!*"

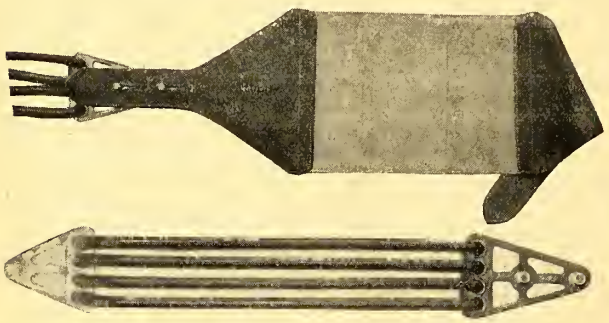
Well, considering what American trains are like, it certainly indicates a considerable amount of courage!

A New Aviation Work.

Mr. Werner Laurie, the well-known publisher, will issue this spring a book on *Aeroplanes in Warfare,* written by Mr. Harry Harper, of the *Daily Mail,* and Mr. Claude Grahame-White. The joint authors are, of course, thoroughly in touch with the latest developments, and there is no doubt that their book will be as successful as both the previous volumes appearing under their signatures.

A New Safety Belt.

As readers of The Aeroplane will probably realise by now, this paper has always been a strong advocate of the use of safety belts for aviators, on the grounds that should a machine make a bad landing, or come down on its nose, or run into anything before it can be stopped, the aviator is often shot forward into the front of the machine and severely damaged; whereas if he can keep in his seat he is more than likely to escape unhurt. It is, therefore, satisfactory to see a firm of the experience of A. V. Roe and Co. putting on the market a really practical safety belt. The weight of this new type has been cut down very considerably, being now only 1 lb. 3½ ozs. complete. Yet at the same time it is very strong, the elastic cord being 7/16 in. diameter.



The aviator can release himself quickly, either with his right or left hand, by simply pulling the leather off the two studs on which it is held on each side. This is an important point, as in a really awkward smash one arm may be powerless.

It is interesting to note that Mr. H. V. Roe, who manages the manufacturing business of A. V. Roe and Co., in Manchester, is also a large manufacturer of elastic webbing, so that one can depend upon the material in the belt being not only of the best quality, but of the most suitable quality.

The price of the belt is 30s., which seems a fairly low price to pay for such an insurance policy. The depth is 7 in., which ought to be about wide enough, and the front is stiffened by a couple of whalebones in the webbing.

Some Bargains.

As usual the weekly bargain list sent out by Weston, Hurlin and Co. is of considerable interest. The last specimen to hand includes such diverse items among second-hand machines as a "Valkyrie" monoplane, some Blackburn monoplanes, a Farman type biplane, and several monoplanes more or less of the Blériot type, which would, no doubt, be quite useful for school taxis. The propellers include Normales, Chauvières, and others, and the engines include the Anzani, Green, etc. There is also an assortment of carburettors, magnetos, radiators, wings, landing wheels, tanks, and material.

An Aviation Directory.

Atmos is undoubtedly the most business-like directory of the aeronautical industry it has been the writer's good fortune to see. It is edited by that excellent journalist, M. Paul Manoury, whose signed articles in *Le Petit Journal* have attained a deservedly wide reputation, and whose proficiency in the English language is illustrated in his directory, which is published in French and English.

The contents may be divided into four sections. The first two form a most detailed and, so far as can be seen, exceptionally complete business directory of manufacturers of aeroplanes, balloons, aero-motors, accessories, timber, metals and other materials, radiators, varnishes, insurance firms, patent agents, propellers, kites, carburettors, magnetos—to select a few headings at random. Nor is the directory confined to French firms; it ranges throughout the world.

The third section contains lists of aerodromes, clubs, schools, with a list of pilots with their addresses, and a condensed "Who's Who." The fourth section contains a complete list of records; while the whole is prefaced by a historical chronology.

The price of *Atmos* is 12s., and it may be obtained from the office of The Aeroplane, 166, Piccadilly, W.

THE AEROPLANE,

166, Piccadilly, W.

Telegraphic Address: Aileron, London. Telephone: Mayfair 5407.

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Applications are invited from British subjects for two expert mechanists and aviators to the Commonwealth Department of Defence, with salary of £400 per annum each, including all allowances except travelling.

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Applications, accompanied by testimonials, will be received up to March 1st, 1912, and should be addressed to The Official Secretary, Commonwealth of Australia, 72, Victoria Street, S.W.

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MISCELLANEOUS.

WOOD FOR AEROPLANES.—Best selected straight-grained hardwoods as supplied to leading aviators—silver spruce, mahogany, kauri, walnut, basswood, peuplier, ash, hickory, elm, birch; special experience in selecting propeller timber.—WM. MALLINSON AND SONS, 130/138, Hackney Road, London. Telephone: 4770 London Wall.

WANTED.—Cheap for Cash. Helmet, Belt, Clift Compass, Maps (Brooklands), Mapholder, Aneroid, Clock, First Aid. A chance for retiring bird-men.—Box 418, c/o THE AEROPLANE, 166, Piccadilly, W.

Useful Model Work.

RUBBER NOTES.

(Continued.)

When lubrication was at first suggested there was an outcry(?) that the lubricants used would inevitably rot the rubber. As a matter of fact, some of them did, and even at the present day it is only too seldom that a lubricant is made to preserve as well as to lubricate.

The lubricant must contain at least three constituents. First, the lubricant itself, which for use with elastic practically means soap, since all the oils are known to be very deleterious, and there is nothing else which has the same lubricating effect. Secondly, since the soap will usually be diluted with water, it is necessary to discourage freezing and evaporation. For this purpose glycerine is best, but it must be used with great care. Only the highest quality should be used, for while pure glycerine is practically neutral, glycerine of low quality invariably contains fatty acids which will destroy the rubber in a very short time. Thirdly, there must be a preservative, for although, as is well known, dry soap will keep indefinitely, a solution of soap and water will very soon become mouldy unless precautions are taken. Now the preservatives possible are very many. Oil of cloves, oil of camphor, formalin, and many other substances are of use, but I have found that there is only one which is cheap, odourless, and non-poisonous, and that is salicylic acid, which takes the form of a white crystalline powder.

A useful recipe for a lubricant containing the above is as follows :—

Water, 10 ozs., or half a pint ; ordinary white soap, ¾ oz. ; glycerine, ¼ oz. ; and a pinch of salicylic acid.

The soap should be placed in the water in the oldest saucepan obtainable—unless the cook be in an exceedingly good temper, in which case her best new enamelled saucepan may be used—and should be stirred constantly while heating and not allowed to boil. When all the soap is dissolved the glycerine and acid should be added, and the mixture poured out into wide-mouthed bottles or gallipots. When it is cool it should be of a thick consistency, something between jelly and thick soup, and should have a most unpleasant, slimy feeling, like nothing else on earth.

Should the user have no objection to getting his fingers dirty, there is one addition which may profitably be made, and that is graphite. Graphite is extraordinary in the preservative effect which it has upon indiarubber ; whereas in the above the salicylic acid was added to preserve the lubricant, graphite is to preserve the rubber, and ½ oz. should be added to the above mixture. But the graphite must be very finely divided, and should be kneaded into the jelly after it has cooled and set. It will be found quite impossible to tie knots in a motor which is lubricated with this mixture. The only way to get the rubber to hold at all is to wash and dry the two ends carefully and then to tie them together with five or six turns of strong thread as tightly as possible, after which treatment they will probably hold.

A point in the care of rubber motors is that if they are not actually in use they should be taken off the machine and left quite slack ; and, if possible, in a place of equable temperature and as far as possible without light. It is well known that sunlight has a bad effect upon rubber ; in order to fight this in rubber-proof fabrics for aeroplanes and balloons, the fabric is coated on the outside with a paint containing chromium, or one of its compounds. It would be very interesting to hear the results of experiments made on rubber motors with a lubricant containing some of these constituents.

Lastly, the motors must never be overwound ; the amount of winding which can be used fairly can be assumed by the knotting which takes place. At about one-third of its full winding the first row of knots is complete ; the motor may then be wound on until the second row of knots. After this care must be taken, as the winder will presently notice that the motor seems to go much harder than before. This is a sign that the motor is wound to its full limit, and any winding beyond this stretches it beyond the elastic limit and causes permanent deterioration.

Motors should always be put on with about ¾ in. of stretch per foot when they are first assembled. If the rubber has been used before this should be less—about ½ in. per foot. After the first winding the rubber stretches about 1½ ins. per foot, but recovers some of this stretch after an hour or so's rest.—P. K. T.

MODEL CORRESPONDENCE.

Sir,—In reply to Mr. R. V. Tivy's letter in this week's Aeroplane, it was the *speed* of the screws to which I alluded ; and even now I fail to understand why Mr. Tivy (with his five years' model-flying experience) was unable to design and construct a suitable pair of "tractors" for his biplane without resorting to preliminary tests with such high-speed screws. I take it the results were unsatisfactory, as this model has ceased to exist?

Mr. Tivy asks if I can "picture" the *real* experimenters competing in "distance," etc., contests. No, I cannot ; but I do notice very keen rivalry between the *real practical* men (or firms), like Blériot, Nieuport, Deperdussin, etc., who are always endeavouring to "go one better" than their competitors in distance, duration, speed, and height ; and I feel sure the excellent results now being obtained are due in a great measure to competitions (not circus performances) such as the French Military Tests and for the Michelin prizes.

A. B. Clark.

Sir,—The Committee of the Brighton and District Aero Model Club desire me to state the facts relating to the alleged 100-second flight.

Briefly, Mr. Willis, on September 16th last, flew a model which we took to be a "Mann." It was certainly on "Mann" lines ; and its best performance was 50 seconds, timed out of sight. No 100-second flight was made, and my committee have never seen or certified a 100-second flight.

There has evidently been some little confusion over the matter which this statement should clear up. So far as my committee is concerned, this closes the incident.

(Signed) J. W. Burghope,
per A. Von Wichmann, Hon. Sec.

Sir,—In reference to Messrs. Willis Bros.' letter regarding the model contest at Brighton on September 16th last, we feel that we cannot do less than make public the entire facts of the case. In The Aeroplane of September 21st we read the official report, as follows : "Mr. Willis flew a twin-screw 'Mann' monoplane, of which his firm are the sole makers. After the competition some flights exceeded the winner's distance, Mr. Willis's 'Mann' monoplane making a duration flight believed by many to be a record for duration, for the timekeeper, Mr. Chas. Barnett, who pursued it stop-watch in hand, lost sight of it after 60 seconds."

The same day we received a letter from Mr. H. W. Willis, from which we quote the following : "I took one of these machines (referring to a batch of 'Mann' monoplanes that had failed to pass our tests) to Brighton on Saturday, and had it in the air for 90 secs. Officially timed to 60, owing to the timekeeper losing sight of it in a clump of trees, which he thought it struck but which was only half its flight. They can't be so bad, can they?"

On November 29th Mr. Willis informed us verbally that after long deliberation the Committee of the Brighton Aero Club had awarded him a certificate for a duration of 100 seconds on September 16th. That being so, we had not the least hesitation in claiming the record, and now Mr. Willis alleges that it was put up "with a machine quite different in size and construction from the 'Mann.'".

This is amazing, and the sequel is even more so ! We have just received from the secretary of the Brighton Aero Club, to whom we had written for a copy of the certificate in question, a letter in the course of which Mr. A. C. Von Wichmann says : "We know absolutely nothing of a 100 seconds' flight, alleged to have been made by Mr. Willis on September 16th. We sent no certificate, nor have we granted one to Mr. Willis. The only possibility we can think of is that our late hon. secretary sent the certificate without consulting. The flight in question was timed to 50 seconds, and a medal will be sent certifying a flight of 50 seconds. We are extremely sorry you have been deceived, but we can assure you it was done without our knowledge."

This being so, we are afraid that our 100 seconds "duration" claim has no basis, but the fact remains that Mr. H. W. Willis himself says that he flew a "Mann" machine upon that occasion. We owe apologies to the public in general and Mr. Trykle in particular, who, as far as we know, holds the world's duration record, our best flight being only 90 seconds out of sight (Mitcham, January 5th, 1912). We always have been very particular about our records, and now that all the facts of the case have come forward, we feel that in common fairness

we must withdraw our claim to a duration which actually has never been performed.

As unfortunately a few complaints have been received by us as to the quality of some of the sets of parts supplied for making the "Mann" monoplane, we would like to point out that, although we were able to guarantee the quality of the complete machines, obviously we were unable to make the same guarantee with regard to the parts which did not pass through our hands, and about which we can accept no responsibility. In future both parts and complete machines are sent out from our own works, and we are able to guarantee both.

We shall welcome any criticism (so far we have received none) of the goods that we supply at present, for our great aim is to give the utmost satisfaction to every customer, no matter how small or large his order may be. And let us inform the public that under our present arrangements they will not now be obliged to wait for the execution of their orders.

MANN AND GRIMMER.
Surbiton.

CLUB NOTICES.

Models in Oxford.—Messrs. F. March and W. N. Ashfield would be glad to hear from anyone interested in model flying in Oxford. Inquiries to Mr. ASHFIELD, at Y.M.C.A., George Street, Oxford.

Manchester Model Aero Club (40, Bignor Street, Cheetham).—Meeting Trafford Park Aerodrome (near golf links), February 3rd, at 3 p.m.—KENMURE KINNA, Hon. Sec.

Paddington and Districts Aero Club.—Next general meeting Windsor Place, Harrow Road, Paddington, February 7th. Lecture 8 p.m. by W. Evans, "Selecting Wood for Model Aeroplanes." Visitors welcomed. New biplane glider constructed by owner, Mr. H. L. Hill, arrived at flying ground.—W. E. Evans, Hon. Sec.

Birmingham Aero Club.—On 27th, interest centred on Wilde's Valkyrie model, rising from snow and making good landings. Trykle, Baker and Prosser doing well.—G. HADDON WOOD, Joint Hon. Sec.

Brighton and District Aero Model Club.—On 27th Bate flew geared monoplane, which gets up well and flies fast. Burghope's 2 oz. monoplane doing strange things at over 100 ft. Flying next Saturday at Shoreham. Communications to A. VON WICHMANN, Hon. Sec., "Kingsleigh," Kingsway, Hove.

Ealing and District Aero Club.—Committee elected 27th; decided to amend rules on exclusion of professionals. Subscriptions fixed at, over 16, 5s. per annum, under 16, 2s. 6d., payable quarterly to S. Hall, who will receive subscriptions at meeting on February 3rd. First quarter's now due. In spite of weather good flights on 27th; Roche's model (3 oz.) flew longest flight, 865 ft., at 80 ft. Kirchner fair flights. Flying February 3rd at 2.30 p.m., usual place.—B. J. KIRCHNER, Hon. Sec.

Worcester Model Aero Club.—January 27th good flying. Next meeting, Pitchcroft, February 3rd, 3 p.m.; various competitions, open to members only. New members welcomed.—STANLEY A. SEARS, Hon. Sec.

St. Mary's Model Aero Club.—Big attendance on Saturday. Triangular Point-to-point of 200 yds. side. Eburne 1st, 28 flights; Restall 2nd. Eburn made club record of 2,050 ft. of 60 secs. Type 0-1-1-2P.

Blackheath Aero Club.—General meeting February 24th, 6 p.m.; new rules proposed. Particulars of suggestions should be forwarded to L. Brough, 12, Manor Road, Brockley, S.E.—A. B. CLARK, Hon. Sec.

Aero Models Association (N. Branch).—Members social by M. B. Ross, Hon. Sec., at 15, Highgate Avenue, N., on 3rd, at 7 p.m. Anyone interested welcomed. Members particularly asked to turn up.

Hackney and District Aero Club.—Demonstration Hackney Downs, Saturday. H. Hurlin, of Paddington, flew W.H.C. models. Flying here every Saturday until Hackney Marshes appear above water. All interested send postcard to Hon. Sec., B. H. LONGSTAFFE, 47, Jenner Road, Stoke Newington.

Scottish Aeronautical Society Model Aero Club.—Barrhead, 20th: J. Mills, 1,145 ft., 33 secs.; J. C. Balden, 1,068 ft., 46 secs.; C. Arthur, 610 ft., 25 secs.; E. Langlands, 44-1/5 secs. Competition, February 17th, at Barrhead. Committee regret to announce tragic death of Mr. Geo. Riddoch, our vice-president. From evidence Mr. Riddoch was engaged in business of club when attacked on 22nd inst. in lane leading to club's old workshop in Hillhead. Mr. F. Norman, of Scottish Aviation Co., delivered lecture 26th inst. Mr. Andrew Forson will be unable to lecture on February 2nd, but will oblige soon.—JOHN S. GORDON.

The Dover and District Model Aero Club.—Meetings Northfall Meadow on 27th. On 24th Whorwell, Davis, Joyce, Holman, and Pritchard flying well in duration competition for pair of 8in. propellers offered by H. T. Holman. Winner, H. Whorwell, 22½ secs.; A. G. Wicks second, 17 secs. At meeting on 27th decided to offer superior "brevet," for ¼-mile flight and questions on theory. New members welcomed Wednesdays and Saturdays at 2.15.—R. C. WILSON.

Bristol Model Flying.—Meeting at Sea Walls, 27th. Longest flights: Moore (single propeller), Pearse, Brewerton, and Smith. Audience took embarrassing interest in large machines and "vol-planés." Meetings every Saturday.—R. V. TIVY.

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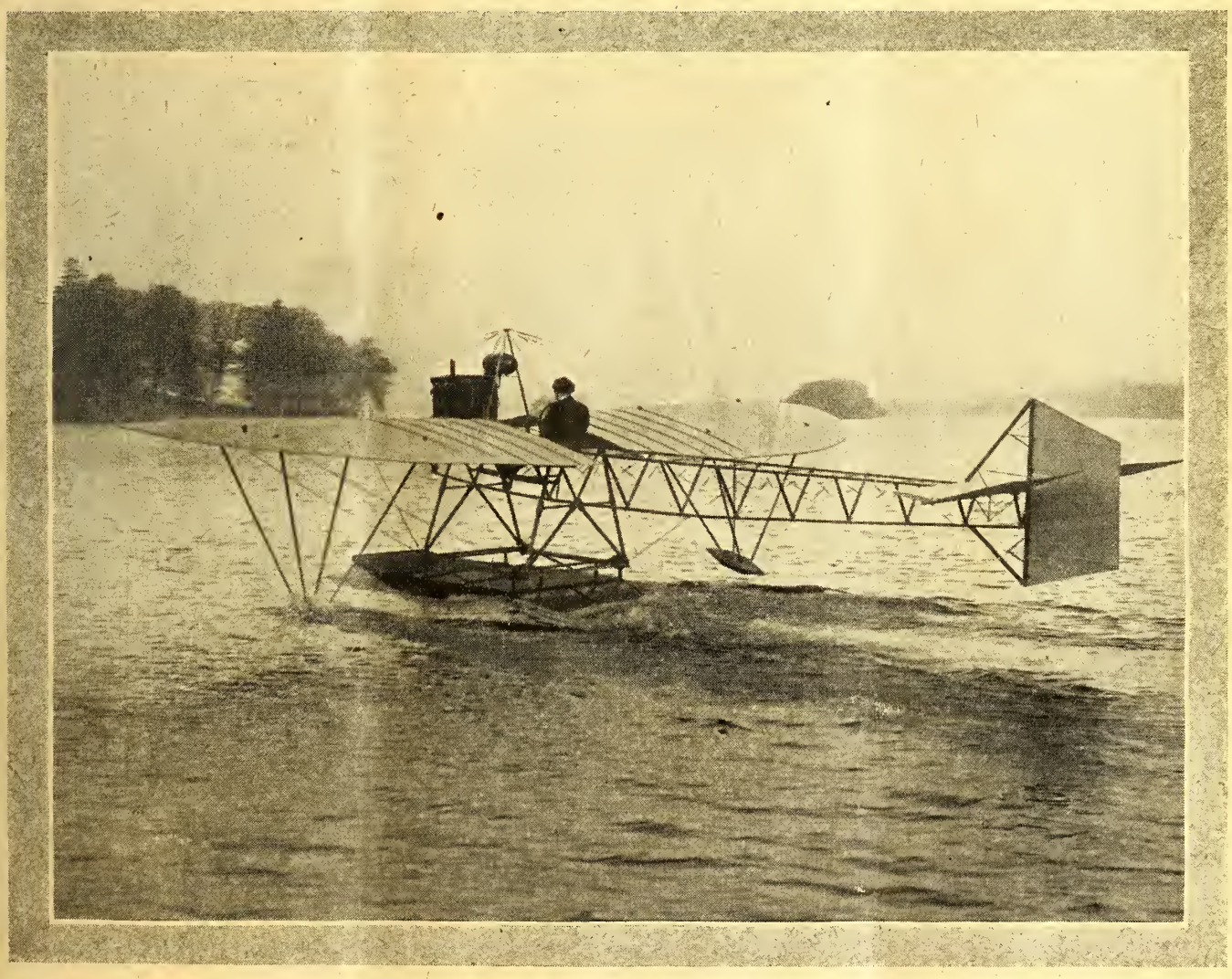
THE AEROPLANE

1D WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

VOL. II. [Registered at the G.P.O. as a Newspaper.] THURSDAY, FEBRUARY 8, 1912. No. 36.

THE HYDRO-MONOPLANE.



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Mr. Oscar Gnosspelius on his Hydro-Monoplane on Windermere. This was the first machine actually to leave the water in this country.

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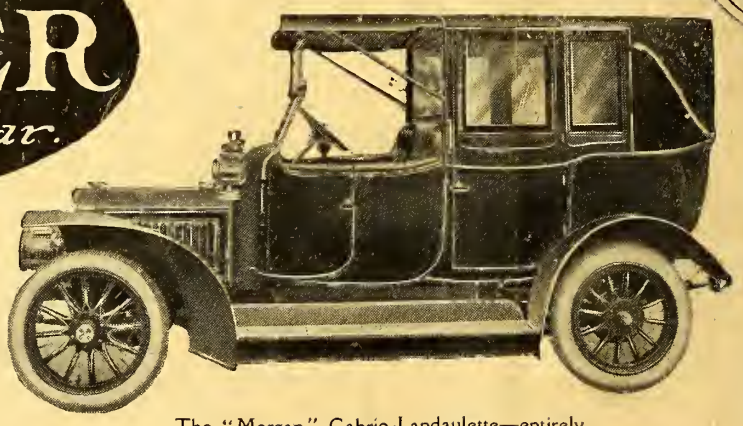

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TO OUR READERS.

Readers of The Aeroplane will doubtless be interested to know that in the past week a change has been made in the publishing arrangements of the paper. From time to time since the paper was started, complaints have been received about the difficulty of obtaining the paper on Thursdays. Under the new arrangements, while the paper will be even more up-to-date in its information than ever, it will be in the hands of all wholesale newsagents on Wednesday afternoons in good time to be on sale in every part of the United Kingdom on Thursdays, and so will be several days ahead of any other aviation paper with its news, and direct subscribers will in every case receive their copies by the first post in the morning.

Various changes have been made in the arrangement of the paper, and it is to be hoped that these will meet with fairly general approval, though it is, of course, hopeless to try to please everybody.

Special attention is being given to the subject of naval and military aviation, and the articles by Mr. W. E. de B. Whittaker, which have already appeared, and have caused a considerable amount of interest in service circles, will be a regular feature. Mr. P. K. Turner will continue to deal with the practical and scientific side of aviation, and all who are desirous of obtaining further information on the theory and practice of aeroplanes are cordially invited to send their enquiries to this office, for though the editorial staff is not omniscient, it is so closely in touch with the men who are building and flying that its sources of information are unrivalled.

Models are now being dealt with in an absolutely separate section of the paper, so that those who are not interested in the subject may please themselves as to whether they read anything about the doings of model enthusiasts or not. As regards model club notices, while it is realised that the clubs are working bravely throughout the country to interest people in aviation, there is no use in the members of clubs trying to persuade themselves that everyone who reads aviation papers is interested in their individual doings, for, as a matter of fact, each club is chiefly of interest to its own members, and, therefore, an attempt has been made to devote to each club space commensurate with the proportion its membership bears to the number of readers of The Aeroplane, though any error in the estimate is in favour of the clubs. Secretaries will greatly assist matters by realising this fact, and making their notices as brief and pithy as possible.

The Visitors' List, which has always been a popular feature, has been abandoned for a reason which is worth noting. It is because many interesting people with valuable news to impart, have refrained from calling at this office to give their views on important subjects for fear that they might be put in the Visitors' List, and afterwards accused by their friends of trying to advertise themselves. It is naturally difficult to please everyone, and in this matter it is hoped that the amount of added valuable information secured by the paper will more than compensate its readers for the lack of some of the personal gossip which undoubtedly appeals to a certain number.

As hitherto, the policy of straightforward, unbiassed comment on all men and matters will be pursued. In these early days of the sport and industry there is need for criticism, for with the safety of the country at stake this is no time for mincing matters, and one cannot consider personal feelings in the fight for the existence of an industry against incompetent and reactionary officialdom. Honour will always be given where honour is due, but no mercy will be shown to impostors.

It is, therefore, to be hoped that the thousands of readers who really appreciate The Aeroplane will assist it in its efforts by introducing it to as many of their friends as possible, and will so help to spread the interest in aviation, and make known the need for national support of aerial defence.

Authoritative Information.

It will be remembered that on January 18th questions were raised in The Aeroplane as to the right interpretation of certain conditions in the War Office Competition; for, though on the whole the conditions, if arduous, are excellent, some of them are so explicit as to lead one to infer that others, which appear ambiguous to the civilian mind, are intended by the framers of the competition to be equally definite when interpreted with military precision. It is, therefore peculiarly gratifying to be able to show without possibility of question that not only do the officials in charge of the competition know just what they want and intend to get, but that on certain other points which are open to debate they have an open mind and are prepared to judge by experience.

In explanation of the points mentioned, The Aeroplane has been favoured with an official communication from the War Office, signed by Mr. R. H. Brade, C.B., Assistant Secretary of the War Office, which says, *inter alia* ;—

"With reference to certain points in connection with the War Office Aeroplane Competition, raised on page 56 of the issue of your paper dated January 18th, 1912, I am commanded by the Army Council to state that, although it is obviously necessary that certain conditions, as to weight, speed, etc., should be specified with as great accuracy as language admits, there are other matters, relating to broad principles of construction, which it is thought should be stated in general rather than rigidly specific terms, so as to give intending manufacturers or competitors some latitude. Thus the example which you have quoted regarding the pilot starting his engine without aid may be interpreted in any of the ways you mention *so long as the essential principle is observed that the machine is not rendered useless by reason of the pilot being by himself.*"

This makes clear at once one of the most important points in the competition, and the words italicised by the present writer should give constructors a clear lead as to their best course in designing their machines. Obviously, for use on ordinary ground, as differentiated from special aerodromes, it will be unwise to rely on starting the engine by the clumsy method of throttling the engine down and swinging the propeller, hoping the while that the engine will run so slowly as not to move the machine. Starting on the switch, or with a starting handle in the fuselage, is likely to be equally bad, for in an ordinary field there would be no room to run about while the engine picked up to full speed. Therefore it seems that something on the lines of the Gilmour patent trip-catch is distinctly advisable, for then the machine can be held by the tail to a fence or a tree or a peg in the ground, and only released when the engine is actually running at its best speed, thus doing away with the need for any assistants, and with any chance of damage to the pilot owing to the machine running over him. The rule is an excellent one, for help is not always available even in one's own country, and a single assistant, as represented by the passenger, could not hold the machine while the engine was run up to full speed.

Further, on the subject of stability and interchangeability, the communication reads :—

"The general interpretation of the ambiguous points you mention ought, it is thought, to present no real difficulty, as it is not intended that abnormal or unusual tests should be required, but that the machines must be able to do what is necessary in weather ordinarily to be encountered in these islands, with a reasonable amount of safety, and that if any portion sustains damage there should be no excessive difficulty in replacing the part from spare stock."

On both these points eminent reasonableness is shown, together with a sound working knowledge of the subject, the only doubt raised in one's mind being whether the judges who may be appointed will be able—owing to the fallibility of human nature—to decide beyond doubt whether one machine is really more stable than another. One may, however, take the above proofs of the reasonable attitude of the authorities as evidence that in these matters of stability and interchangeability the judges will decide more by common sense than by any hard and fast rule.

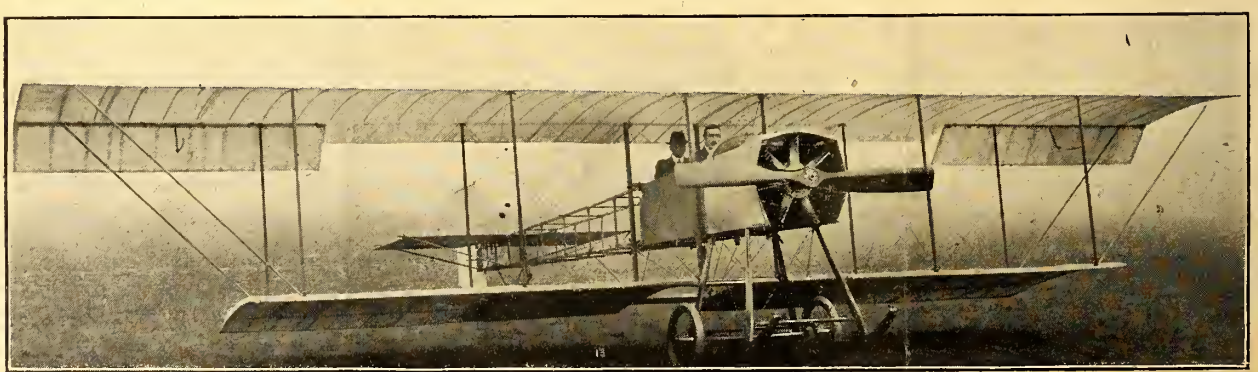
"Julia" Speaks.

There is a departed spirit named "Julia" who from the goodness of her heart makes from time to time communications to Mr. W. T. Stead, who in turn imparts them to an expectant world. She converses, it appears, with those who have previously left this earth and who desire to convey a message to someone yet alive. Her voice is heard but rarely. Many months may drift wearily by, and Julia makes no sign. No illumination comes to men's minds from the Great Beyond. And then she speaks, and the evening papers are gratified.

According to Mr. Stead, she told him in 1909 to warn his friend the Prince Bolotoff, a Russian, who was at that time building an aeroplane of his own design, against making any flights. She said the warning came from Lefebvre, the distinguished pilot of a Wright biplane, who had recently been killed. Mr. Stead, ever devoted to the service of Russia and Russians, at once left for Chalons, where the Prince Bolotoff was constructing his machine. The Prince received the warning as a gallant man, and refused to take any notice of it. The next morning his aeroplane was brought out of its hangar and he prepared to make a flight. Something went wrong, and a flight was impossible. Strange though it may seem, the previously incredulous prince accepted this as a confirmation of the ominous message from the heavens, and since that date has made no flights. "Julia" and Mr. Stead may both derive happiness from the thought that they have preserved a human being from a horrible death. The writer, who had the privilege of seeing the prince's machine at Chalons, agrees with others who have seen it that, judging from its appearance, the Prince was unlikely in any case to come to any harm whilst aviating with it, and that opinion has been borne out, for, unlike the Dutchman, it never flew. Rumour has it that the Prince is constructing what the public prints call cryptically a "mystery biplane" in his mother's garden at Norwood.—W. E. de B. W.

The Greatest Sportsman.

The French Académie des Sports has in its gift a prize of the value of 10,000 francs, presented by M. Deutsch de la Meurthe, to be given to the performer of the most sporting feat of the year. For the first time this prize falls to an aviator. In the view of the Académie, the great flights of Naval Lieutenant de Conneau are the greatest sporting events of the past year, and it has awarded the prize to him.



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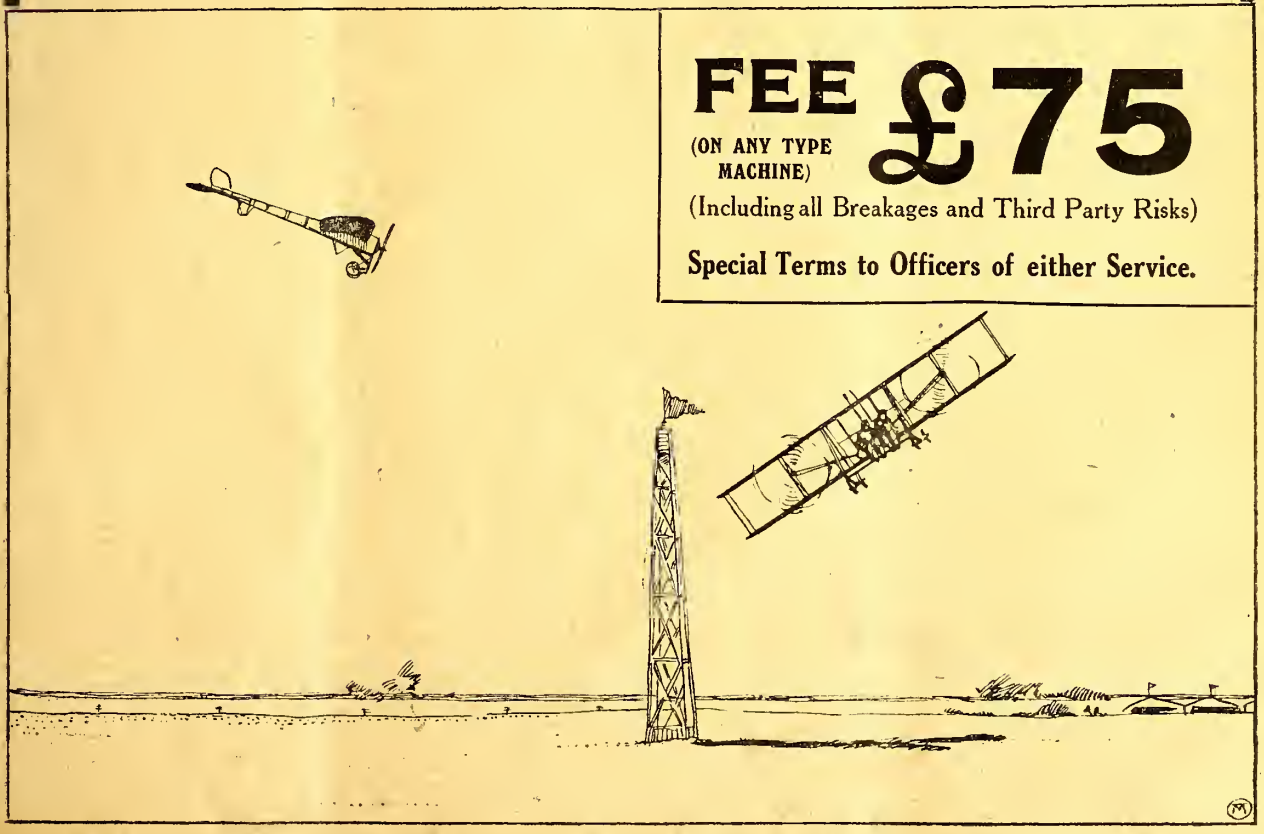

AIR CURRENTS.

THE AIRMAID;
Or, the Airman who Didn't.

The airmaid reclined on a cloud bank, paddling her feet in the brook of clear air that wandered through the sylvan scene. She sighed, "Oh, Willow! Willow!" All society had moved up to a higher plane for the holidays. She felt bored.

One delicate hand of the airmaid caressed the plumes of her iridescent wings. The wind instrument that all airmaids spend the greater part of their time playing lay neglected at her side.

Suddenly there was a crash, and something shot up through the babbling brook, considerably damaging the ethereal landscape. 'Twas a man—the first shady object the airmaid had ever seen.

The intruder was strapped beneath a miniature balloon. In one hand he bore a small Union Jack; in the other a tube, at the end of which sprouted a propeller.

"Excuse my not removing my hat," he said, catching sight of her at once. "The fact is, it's not a hat at all. It's a helmet."

"It speaks," she murmured. ("Oh, Willow!")

"It" also brushed a few fragments of the scenery from its shoulders.

"Do not, pray, think this hump is natural. Fact is, it's a little invention of mine for providing suitable breathing air. What you are looking at is not my head, either. I am not at all bad looking, from about the distance you are standing. It's an ether diver's helmet. The balloon is also detachable. I don't want it really. It is a concession to an old-fashioned prejudice. As a matter of fact, most of the lift is done by my 70,000 League Ergaer Boots. I mention these facts in case you should think I'm a freak, or a volcanic eruption. Pray came a little nearer. Heavens! Be still, my heart!"

The last was aside. All airmaids are charming.

Meanwhile, the airmaid played a meditative air upon her pipe.

"And what do you call this place?"

"What should I call it," she replied, "but the airth?"

"American accent," he remarked. He, also, played meditatively, but 'twas with the tube he bore in his hand conveying current to the propeller that guided his every movement.

"Anyhow, I take possession in the name of Great Britain."

"How noble of you!"

"I'm afraid it's a little informal, but the fact is I hadn't the slightest intention of arriving here. I ought to have looked the procedure up. Strictly speaking, I ought to stick this flag somewhere——"

"Oh! don't mention it, *please*."

"And you are really considered good-looking," she added, somewhat irrelevantly.

"I am considered so where I come from."

"And that is——?"

"Yes, below. And the worst of it is," he added parenthetically, "the old globe is turning round and round, while, for all I know, this place is stationary. Goodness only knows where I shall land, when I come down——"

"I have always been given to understand," remarked the airmaid, "that only the very worst people came from or went below."

"I can quite understand your low estimation of the world," he said. "We ourselves thought it the very first move in history when we flew off it."

"You did not fly to heaven," said the airmaid, "'Cos why? You haven't wings."

"I have my boots——"

"But it's more than 70,000 leagues."

"True, it would be a good step."

"And you couldn't get there by balloon."

"No," said he, absently.

"None the less," he added, "a lot of importance is attached to gas. Ha! ha!"

"Have you a pain?" enquired the airmaid.

"I merely laughed," replied the airman. "It's this confounded helmet. It exaggerates things. I'm not accustomed to speaking out of a safety valve in the back of my neck. There I go again! Now, do you know its exceedingly rare for me to make two jokes running. Must be the effect of the rarity of the atmosphere."

"You are so original," said the airmaid. "That's what I like about you. Do you know, I have never seen anybody quite like you before."

"How splendid of you to say so," he replied. "I should look better still without this helmet. It isn't really like me at all. . . ."

So matters hung for a while.

"And is the—the place you come from very dreadful? And are you a very naughty—airman?"

"So, so," replied he, with modest skill. "The fact is, you know, I was one of the first men to try and fly off the world. Consequently, I have gone up considerably in public estimation, and am one of the first men on it. My character is moderately good—only moderately."

"Fain," said the airmaid, "Fain would I visit this strange home of thine, and learn more of it and thee. Fain," and so on.

* * * * * * *

"Then why not fly with *me*?" said the airman. This was subsequently, so there was no attempt at rhyme.

"Touch me not," exclaimed the airmaid, totally mistaking a movement. "If you squeeze me I shall die!"

"Too true," said the airman, regretfully. "I'm afraid you would. I'm much denser than you, but I'm not so dense as all that. Alas! And, in any case, what would my wife say? Too late! My oxygen is giving out. I must descend. Farewell, child of my dreams, a long farewell! I hope to see you again. Though whether I shall strike the same place again, or not——"

So saying, he placed the propeller between his far-famed boots, and, switching on the current by pressing a waistcoat button, sank gracefully from view, his hand upon his heart. The airmaid stretched imploring arms. . . .

He was falling, falling——

And then, by a strange coincidence, the alarm clock went off.

F. A. G.

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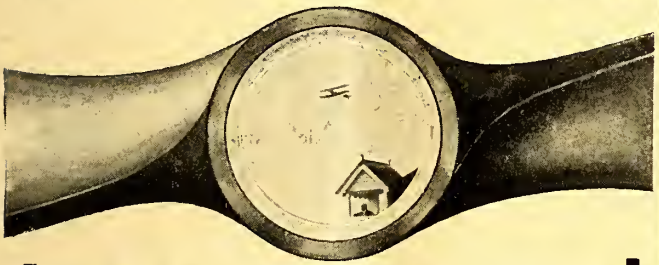

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The Apparent Requirements in the Military Trials.

By W. E. de B. WHITTAKER.

In the drafting of Government contracts and specifications in the case of articles whose form and limitations are known with precision, no clause is of greater importance than any other, and the terms in use being customary, have but one technical meaning. But in the case of specifications relating to things, the combination of the details of which are still in a nebulous state and of which the limitations are not known to any degree of accuracy, it is a matter of difficulty for manufacturers to appreciate the degrees of importance of the different requirements.

Take, for instance, the supply of a battery of guns of a standard type. It is known to authorities exactly what a gun of the type specified can do, therefore all the items of the specifications are equally possible and are insisted upon to an equal degree. On the other hand, in the ordering of the product of a new science, as but little is known of the possibilities, the attributes marked as necessary in the specification are subject to alterations in the final trials and often to elimination. In the course of years this indefiniteness will disappear, but the manufacturer's present trouble will not be the less because the future holds promise of improvement in the clarity of the language of official papers.

The conditions and specifications relating to the military aeroplane competition were published by the War Office in December last. Such comment as was made on them by those who have knowledge of the difficulties in the way of the officials whose duty it was to arrange the specifications was highly favourable, and some surprise was expressed that these difficulties were overcome so well.

To such people as have had no experience of the phraseology employed by the War Office or of the particular definition of certain words used, many of the clauses appeared ambiguous to a degree. To a great extent this ambiguity will disappear as the manufacturers become more accustomed to the form of Government contracts. But it would be well if at the present stage of affairs the War Office could find it possible to issue an explanatory statement of the meaning of the separate clauses of the conditions.

Certain conditions laid down are definite and unalterable—conditions which can be fulfilled by the manufacturers if they take the necessary trouble. Of such is the first clause.

"The machine must be delivered in a packing case suitable for transport by rail, and not exceeding 32 ft. by 9 ft. by 9 ft. The case must be fitted with eyebolts, to facilitate handling."

Questions of transport have dictated the details of this condition. The aeroplane in time of war will be sent by rail to the headquarters of the particular force to which it is to be attached. It is essential that it be securely packed in a case that no damage may come to it by reason of rough handling, and also that it may be in most compact form, so that it will occupy the least possible space. Munitions of war and supplies of all kinds occupy so large a space in the modern army that all means possible are taken to reduce the bulk of each item as much as may be.

At the rail-head the aeroplane, still in its case, will be transferred to a trolley towed behind a motor wagon, or to a Renard road-train; and until it is put to actual use it will remain in a packed condition. The conditions relating to packing cases are with a view to rail transport chiefly, but the circumstances governing both rail and road are very similar. Those who are conversant with the problems of transport will realise how liberal the authorities have been in the questions of dimensions.

Clause 8, that the machine must "be capable of change from flying trim to road transport trim, and travel either on its own wheels or on a trolley on the road; width not to exceed 10 ft.," and the "desirable attribute," "(*f*) that the time and number of men required for the change from flying trim to road trim, or packed for transport by rail and vice versa, should be small, and these will be considered in judging the machine. The time for changing from road trim and packed condition to flying trim to include up to the moment of leaving the ground in flight, allowance being made for difficulty in starting engine," must be considered together and are of great importance, for, one would think, obvious reasons.

Mobility and speed of action are of such great importance in modern warfare that the question of time has a large bearing on the usefulness of any object used in the carrying on of a campaign. The value of an aeroplane to a general officer commanding will vary according to the speed with which it can be brought into action. It is therefore necessary that the time taken to assemble an aeroplane shall be as little as possible. The same necessity, of course, applies to the rapidity of packing the same machine. It is equally necessary that these two operations should not require the employment of a large number of highly-trained men.

No period of time is laid down in which it is required that the assembling and dissembling of machines shall be completed. An aeroplane may be put into flying trim from a packed state in record time, and yet be manifestly unsafe to fly. Officer-pilots killed in action may be mourned and missed, but their deaths will be accepted as a necessary feature of war; whereas the death of pilots through the collapse of machines badly though rapidly assembled will cause sufficient annoyance to make the manufacturer's life a burden and a disgrace.

The time absorbed in erecting aeroplanes will be judged according to the efficiency of the said machines after erection. The assembly of one aeroplane may take half an hour and another may take two hours, and yet the latter may be looked on with more favour. It is entirely a question of efficiency.

Clause (11) "All parts of aeroplane must be strictly interchangeable, like parts with one another and with spares from stock," is essentially one of delicate ambiguity to the civilian and almost equally so to the prescient ones of Whitehall. Despite rumours to the contrary, it is not intended that an engine cylinder should be used in emergency as a rudder or a shock absorber; but it *is* intended, as has been previously said in this paper, that it should be possible to change a propeller, an engine, or a wing, and so on, for similar parts which shall be strictly the same in dimensions. Further, it appears as though the authorities desired manufacturers to use, for instance, as few different gauges of wire as possible, wire-strainers, in so far as they are able, of a similar size, and so on. The reduction in number of differing types of the same parts is aimed at, so that consequently it will not be necessary to carry so large a stock of spare parts as would otherwise be required. The War Office, from the depth of their knowledge, would no doubt prefer machines with wings so designed that either wing will fit either side, as in the case of the Antoinette.

The clauses dealing with the actual flying capabilities of the machines engaged in the trials will settle their own difficulties. The makers of machines fulfilling all these requirements will find no difficulty in dealing with the previously discussed clauses. The weight carrying and duration clauses are neither unreasonable nor exacting, and both are essential points of the trials; but it is probable that the War Office will find it necessary to modify the speed of rising and the gliding angle. These two are the least essential of all the flying attributes required. The modification, however, will be slight.

The landing and getting-off clauses are all of great importance, but the results shown under these clauses during the trials will be examined in the calm light of reason. It is useless to insist on the impossible, and it is the duty of the manufacturers to demonstrate which requirements are impossible of attainment, if any.

Another essential is Clause 13, that engines "must be capable of being started up by the pilot alone"; but I presume no manufacturer will find that difficult of attainment. The use of a starting handle is apparently intended.

The remaining clauses are all obviously intended to be carried out to the letter, and are at the same time quite within the bounds of reason.

There is a proverb which speaks of the naming of dogs and its future effects on the canine reputation which in practice is only too true. The War Office has suffered heavily at the hands of its critics, often without cause, and the reputation of its officials for commonsense is of the weakest kind. But sweet reason dwells as amicably within the portals of the War Office as within the most civilised of business offices. To anticipate the worst in a competition is a poor way of beginning preparations.

It is certain that manufacturers will receive the most courteous treatment during the course of the trials, and it is also certain that any representations they make as a body will be given the deepest consideration by the departments of the War Office in whose hands these matters are placed.

[It should be particularly noted that Mr. Whittaker's article was already in type when the official notification from the War Office was received.—Ed., The Aeroplane.]

The Formation of the Air Battalion.

It is not inappropriate to republish the Army Order relating to the formation of an Air Battalion in the British Army originally issued as a Special Army Order on February 28th, 1911. The text is as follows :—

A.O. 61/1911. Royal Engineers, Air Battalion—Peace Organisation :—

(1) *Object.*—With a view to meeting Army requirements consequent on recent developments in aerial science, it has been decided to organise an Air Battalion, to which will be entrusted the duty of creating a body of expert airmen, organised in such a way as to facilitate the formation of units ready to take the field with troops, and capable of expansion by any reserve formations which may be formed in the future.

In addition, the training and instruction of men in handling kites, balloons, aeroplanes, and other forms of air craft will also devolve upon this battalion.

(2) *Organisation.*—The establishment of this battalion, which will be organised into (i) headquarters, and (ii) two companies.

The personnel of the headquarters will, in addition to the usual administrative duties, be available to form the nucleus from which the two companies can obtain additional officers, warrant officers, non-commissioned officers and men as required.

Each company will be organised as a separate and self-contained unit.

(3) *Personnel—how obtained.*—The officers will be selected from applicants from any regular arm or branch of the Service on the active list.

(4) *Qualifications of applicants.*—An applicant must be recommended by his commanding officer and be certified as medically fit for the work.

It is not considered necessary to lay down definite rules, except as regards the minimum length of service, but the following qualifications will be taken into consideration when selecting officers :—(*a*) Special recommendation by commanding officer ; (*b*) possession of aviator's certificate ; (*c*) previous experience of aeronautics ; (*d*) rank not above that of captain ; (*e*) medical fitness for air work ; (*f*) good eyesight ; (*g*) good map-reader and field sketcher ; (*h*) unmarried ; (*i*) not less than two years' service ; (*j*) under 30 years of age ; (*k*) good sailor ; (*l*) knowledge of foreign languages ; (*m*) taste for mechanics ; (*n*) light weight (under 11 st. 7 lb.).

An application for appointment to the Air Battalion will be submitted to the War Office through the usual military channels.

(5) *Conditions of service.*—A selected candidate will, on joining the Air Battalion, go through a six months' probationary course (including two months' kiting and ballooning), and, if during this period he shows no aptitude for the work, he will rejoin his unit. An officer who satisfactorily completes the probationary period will be appointed to the Air Battalion for a period of four years (inclusive of the period of probation) and will be seconded.

Although the appointment to the Air Battalion will normally be for the above-mentioned period of four years, an officer may at any time be permitted to resign his appointment with the battalion.

(6) *Pay and allowances.*—An officer, other than an officer of the Royal Engineers, who is selected for the Air Battalion, will draw pay under Article 187 of the Pay Warrant, from the date of his first appointment to the battalion.

(7) *Warrant officers, non-commissioned officers and men.*—The warrant officers, non-commisioned officers and men will be selected from the Corps of Royal Engineers.

(8) The existing Balloon School will be superseded by the Air Battalion, and the new organisation will be regarded as taking effect from April 1st, 1911.

It is an excellent example of the distance between intention and execution. The excellent promise shown in the Army Order has vanished almost as completely into thin air as do the freshly-made New Year's resolutions of unregenerate man. Those responsible for the framing of the Order apparently showed their opinion of it by ordaining that the new organisation should take effect from April 1st, 1911.

Clause 3, for one, has been ignored, a letter having been issued to General Officers Commanding asking for Royal Engineer officers to serve in the Air Battalion, a complete contravention of the terms of the Army Order.

The next clause also puts difficulties in the way of the appointment of useful officers. A good regimental officer finds it a matter of difficulty to persuade his commanding officer to recommend him for attachment to another branch of the Service.

The *conditions of service* (Clause 5) are similar to those laid down in the French and Italian Armies, and with the exception of the two months' kiting and ballooning, are excellent.

The Army Order, if carried out, would have provided the Army with a nucleus air corps of sufficient size to make expansion fairly easy. The damage done by issuing an order and then treating it with contempt spreads further than the section to which it refers. A surer system for the destruction of confidence in the good faith of the supreme authorities could not be devised.—W. E. de B. W.

German Army Aviation.

On February 1st thirty-two officers commence an aviation course at the Johannisthal Aerodrome. They will be distributed amongst the following five schools : Rumpler, Albatros, Dorner, Harlan, and the Luft Verkehrs Gesellschaft. This latter firm has built copies of the Morane and the Nieuport. The German is apparently an excellent copyist.—W. E. de B. W.

An Aeroplane in Action.

It is reported from Tripoli that on February 1st Lieut. Rossi, a volunteer military aviator, accompanied by Captain Montu as observer, flew from Tobruk over the enemy's camp. A number of bombs were dropped, apparently with good effect. The enemy replied with rifle fire, four bullets striking the machine, one of them slightly wounding Captain Montu. The aeroplane used was a Farman biplane, but as no information is given of the height maintained or of the weather conditions prevailing at the time, little can be learnt from this flight. The effect of rifle fire on aeroplanes in action has not yet been determined, and any information on the subject is of importance. Captain Montu is a member of the Chamber of Deputies, and went to Tripoli to organise a corps of volunteer aviators.—W. E. de B. W.

Mr. Gilmour starting from Hendon on the Martin-Handasyde Monoplane on his way to Brooklands.

A Discussion on Soaring.

The Aeronautical Society held an interesting, and at times amusing, discussion on Soaring Fight at the Royal United Services Institute on Tuesday of last week, Sir J. Wolff Barry being in the chair.

Mr. A. E. Berriman, opening the discussion, said that soaring "is that mode of flight in which a bird remains indefinitely aloft without flapping its wings. Gliding is also a mode of flight, but differs from soaring in that the path of motion is, on the whole, downwards, whereas in soaring there is no permanent loss of altitude. Flapping flight differs from soaring flight in that the bird exerts visible energy. From these facts may be deduced—what is otherwise a matter of elementary perception—that flight of any description involves the expenditure of power, and that in soaring flight this energy must come from the air. The primary question for discussion was, therefore, what form does this energy take?

"All forms of flight demand relative motion between the object supported and the air. But the body thus supported offers resistance to such relative motion; consequently it will be blown away in the same direction as the wind unless an opposing force of propulsion enables it to hold its own. In a paper kite, this force is a pull on the string. In an aeroplane, it is the thrust of the engine-driven propellers. In a glider, it is the component of gravity in the line of motion. In a soaring bird it is the horizontal component of the wind pressure on the bird's wing which has a forward direction (i.e., against the wind) by virtue of the resultant being inclined forward of the vertical. It is impossible to obtain a forwardly inclined resultant from any kind of wing section in a truly horizontal and uniform wind, hence soaring flight is impossible under such conditions.

"If the wind is not horizontal, but has an adequate upward trend, sufficient propulsive component will be established to permit soaring flight to be continued indefinitely. The least upward velocity component that will satisfy this condition of soaring flight is numerically the same as the rate of vertical descent when gliding in calm. If the wind blows parallel to the side of a hill having the same slope as the gliding path of the bird, the wind must have at least the same velocity as the bird's natural flight in order to maintain soaring. Obstructions such as cliffs, houses, and ships, cause horizontal winds to trend upwards to an extent that is frequently adequate to maintain soaring.

"Mr. Lanchester says: 'The region of greatest up current is evidently immediately in advance of the upper edge of the cliff, and the useful region may roughly be defined as a circle whose centre is slightly above the level of the plateau, and whose diameter is about equal to the height of the cliff. . . . Further, in some cases the up current may arise from the motion of a body through the air in lieu of the air moving past the body. In this way ships, especially sailing vessels, may conceivably become the cause of an aerial disturbance that the soaring bird can turn to its advantage.' And further, 'The only estimate extant of the flight angle of a bird that can be considered reliable is that of Bretonniere, who, from observations made on a number of storks, concluded that the gliding angle of this bird is 10 degrees, or 1 in 5.7.'

"It is a question for discussion whether the evidence of a falling feather would be proof of the non-existence of an up-current in this order of magnitude. Dr. Hankin observed cases in which soaring flight is maintained in an atmosphere through which a feather detached from a bird's breast slowly fell to earth. Because we exist in the proximity of the boundary surface (the earth) to a fluid region (the atmosphere), where relative motion of any magnitude is only possible in a direction parallel to the surface, our common impression of winds is that they are all horizontal. Air that is lighter than its environment tends to rise by upward acceleration, causing thereby the colder air to flow in horizontally towards the hotter regions. Up currents are, therefore, the primary cause of the horizontal winds that we are so apt to regard as the only natural mode of air in motion. The cool air sweeps in horizontally toward the hot centre, but does not blow across it. An invisible core of rising air deflects its course, so that the bulk of the horizontal wind flows upwards from afar, and by gradual curvature at length acquires a vertical motion at a considerable height above the ground.

"Mr. Lanchester says: 'If a column of heated air is but 1 deg. C. hotter than the surrounding air, then its density will be approximately 1/300 part less than normal, and if the height of the heated column be 300 ft., the difference of pressure by which it is propelled will be equivalent to a head of one foot; this, by the principle of Torricelli, corresponds to a velocity of 8 ft. per second, which is more than sufficient to sustain a gliding bird without loss of altitude.'

"All observers stationed in apparent calm who have watched soaring flight agree:—

"1. That the birds do not begin to soar until after the sun has risen awhile.

"2. That all birds make a flapping ascent to an altitude of a hundred feet or so.

"It has been stated (1) that soaring in a calm is impossible, (2) that soaring in a uniform horizontal wind is impossible, (3) that soaring in a uniform wind blowing obliquely upwards is possible, (4) that soaring in an up current is possible.

"It remains to state that soaring in a horizontal pulsating wind is possible. Lord Rayleigh in 'Nature,' 1893: 'The conditions for soaring flight: (1) The course is not horizontal; or (2) the wind is not horizontal; or (3) the wind is not uniform.' In order to maintain soaring in a horizontal wind, the velocity may fluctuate with time or place. That is to say, if the speed is the same simultaneously throughout the zone, then the velocity must change during the next instant of time, but if the velocity is different simultaneously in adjacent regions, then the speed at a given point may remain constant.

"Langley says: 'In a high wind the air moves as a tumultuous mass, the velocity being at one moment perhaps 40 m.p.h., then diminishing to an almost instantaneous calm.'

"Meteorology has shown that wind velocities commonly increase with altitude, wherefore the soarability of the air is presumably greater at greater heights. Obvious examples of fluctuation of wind velocity with place occur in the vicinity of obstacles capable of creating a region of dead water on their lee side. Sea waves may do this with a surface wind, and the low gliding flight of some sea-going birds is explicable by this theory."

"Ergaer."

Dr. Hankin, who followed, is well-known to the members of the Aeronautical Society as the propounder of the theory of "Ergaer," which is a name he has coined for some undiscovered property of air which enables a bird to soar without an upward current, and he hazards the guess that this "Ergaer" operates by exploding under the bird's wing in certain conditions of the atmosphere.

Dr. Hankin said that in his published accounts he had written what he saw whether it appeared possible or not. He also said that his critics alleged that his arguments in favour of "Ergaer" were insufficient, and pointed out that research was carried on to discover facts, that a theory was only a preliminary classification of facts, and he thought too much respect was paid to authorities, and not enough to the facts themselves. He had seen vultures avoiding known currents, and in a certain ravine where an up-current was known to exist the birds only soared in the sun and flapped when it clouded over—(a neighbour in the audience suggested to me *sotto voce* that probably when the sun was hot the birds took it easy and only soared, but when it clouded over they flapped to keep warm *à la* cabmen).

Dr. Hankin wanted to know whether soaring was due to potential energy (Ergaer) or the kinetic energy in the wind. In the same ravine after rain the air was unsoarable, and wing beats were easily heard owing to the sound travelling far, thus showing the homogeneity of the air and absence of disturbance. This was an argument in favour of the kinetic theory. On the other hand, he had seen a cheel soaring and rising in a descending current, as shown by clouds descending on the lee side of a steep hill, although practically no wind was blowing at all. (Here my neighbour interjected the remark that probably the cheel had a better gliding angle than the clouds, and was so able to go up while the clouds were coming down.) Also he had seen hill crows circling and rising without flapping when no wind was blowing, and an adjutant bird doing 30 or 40 miles per hour without flapping, and passing close to a piece of thistledown floating immovable. He admitted the existence of heat eddies, but they could not account for some phenomena of soaring. He also described various forms of instability in soaring birds, which he attributed to patches of air which were short of Ergaer.

Mr. Weiss's Experiences.

Mr. José Weiss, who probably knows more about soaring flight than all the rest of the room put together, said that he had often observed up-currents on the lee side of hills, these

being caused by the air blowing across the top of the hill and drawing air with it from the lee side. He thought a well-balanced bird could glide at about one in fifty, so that a very slight up-current was enough to support it. He, himself, had once got one in thirty out of a model in dead calm air. He had seen models by luck do all that birds can do, and there was no difference in principle between a gliding model and a bird, except in degree. A soaring bird was only a falling body, but was able, owing to its efficiency, to follow the line of least resistance and obtain forward movement. In an artificial glider the wings had to be absolutely symmetrical, and the centre of gravity exactly coincident with the centre of pressure, which was very difficult to attain. Speed was determined wholly by the relation of weight to surface. He had some time ago, with Mr. Handley Page, carried out experiments to find out the suction on the tops of curved surfaces, and it was to this suction he attributed efficiency in soaring.

Mr. Wilfred Aston asked Dr. Hankin whether he had any records of humidity in calm, soarable air, and also wanted to know the effects of local thunder-storms, and whether light and heat were both needed to make air soarable. He also wanted to know what happened when the Ergaer had been extracted from air.

Mr. Alec Ogilvie said that when experimenting with the Wright Brothers and their glider, they had a hill running from 1 in 6 at the top to nothing at the bottom. They found they were able to soar near the top, but could not get out horizontally. It was harder to glide from the middle of the hill and easier again nearer the bottom. The machine they were using had a gliding angle of about 1 in 9 at a speed of 25 miles per hour, or a descending rate of about 4½ ft. per second. Coming home on the liner he had opportunities of seeing some fine up and down soaring by gulls in a cross wind, the birds turning in circles of about 80 ft. diameter in three seconds.

"Curlies."

Mr. Mervyn O'Gorman, in a humourous and entertaining speech, suggested that Ergaer was a name for something that Dr. Hankin did not quite understand. He wished to put suggestions in the form of questions as Mr. Aston did. Was it not reasonable to suggest that air might be humid in patches? Humid air rises, and at 40 per cent. saturation can absorb 72 times as much heat as dry air. If air was irregularly humid, might it not rise irregularly, not from the ground but from anywhere? Ozone existed irregularly in air, and remained quite local. It was 136 times more absorbent of heat than oxygen. Perfumes also absorbed heat, which possibly accounts for ladies being lighter on their feet than mere men. In this way might not small eddies exist in the air? Said Mr. O'Gorman, "I do not know much about birds, but I once had a parrot," which apparently had not assisted him much in the study of soaring flight. He suggested that soaring might be due to little eddies in the air, which, for lack of a better name, he suggested might be called "Curlies," and wound up by saying, "I submit my curlies to Dr. Hankin." As a matter of fact, Mr. O'Gorman's theory of curlies is probably not very far wide of the mark.

Barometrical Propeller-Torque.

Mr. Mort, of the N.E.C. Engine, said that air resistance varied very much with moisture. For instance, in testing one of his engines he found that with the barometer at 29.1 ins., the torque was 192 ft. lb.; at 29.9 it was 202 ft. lb.; at 208 it was 30.4 ft. lb.; the engine doing exactly the same number of revolutions. There were changes in viscosity as well as in temperature, and air resistance was less in the tropics. Was it not, therefore, possible that birds used masses of air which were displaced upwards?

Colonel Fullerton, the late Secretary of the Society, said that Mr. Albert Ross—an appropriate name—had evolved in America much the same theory as Dr. Hankin. It was, at any rate, certain that a combination of hydrogen and chlorine was inert in the dark, but exploded in light.

Mr. V. E. Johnson spoke of experiments with model gliders.

Dr. Hankin, in summing up, said that he had observed the air carefully in relation to thunder-storms, and found that air from outside ascended into a thunderstorm, but was unsoarable, and that air descending from under the storm was soarable.

Perhaps here I might be allowed to advance a theory of my own in conjunction with Mr. O'Gorman's theory of "curlies." Some of us have observed that with certain propellers it is quite easy to see the slip-stream coming off the bladetips when the engine is running. This is presumably due to the displacement of the components of the air causing refraction similar to the refraction one observes over a fire or a very hot piece of ground. Might it not be possible that in some millions of years of development the eye of the better-class bird has been so trained in refractive indices that it is able to see every little "curly" and take advantage of it?

General Ruck gracefully proposed a vote of thanks to the Chairman, who, though he called himself an ignoramus on the subject, seemed to have a very good grasp of it, and to be keenly interested.—C. G. G.

Lieut. Seddon, R.N., on Engine Position.

Writing shortly after his accident at Eastchurch, apropos of the editorial comments thereon, Lieut. Seddon, R.N., says: "I trust you will permit me to correct the very unjust reflection you cast on the safety of the design of Mr. Short's biplane in your article, 'A Lesson for the Navy.' I took that shed at something over 30 miles per hour—absolutely end on—thanks to putting the rudder lever the wrong way at the critical moment.

"What happened? Well, there was an unholy smash, and then, when everything had stopped, I found myself sitting perfectly comfortable in the seat. The engine was still in its place, the petrol tank had not patted me on the back, nor were there any loose spars digging me in the ribs. I jumped down to the ground, and found my left leg was broken. This happened only because I had my leg pushed out hard in a belated endeavour to steer the machine correctly, and the blow on the end of the rudder bar became a direct blow on my foot. Most emphatically I was not injured through being boxed up in any sense. The chassis probably took a great part of the shock.

"Altogether I cannot help thinking that this stupid accident reads the lesson that the pilot-in-front machine can be made reasonably safe for the pilot. The engine-behind machine does, undoubtedly, possess advantages over the tractor machine.

"Of course, no one will deny that the further to rear the pilot is the safer he is in collision. But, surely, this would afford a sound argument for the Navy to only adopt machines with the pilot's seat on the tail. Anyway, I think the whole thing is a matter which will require more than a little flogging out."

Mr. Seddon's views are those of a thoroughly good sportsman who is ready to blame himself for his own troubles, and everyone will be pleased to see that so soon after so bad an accident he was able to take an active interest in things. However, he is in error in thinking that the writer had any intention of casting aspersions on the design of the Short biplane, for The Aeroplane has always held the Short machines up as outstanding examples of constructional design. As a matter of fact, the probability is that if Mr. Seddon had done the same thing on most machines of the same type he would have had much more than a "pat on the back" from the petrol tank.

Any of the naval aviators at Eastchurch would, undoubtedly, be only too pleased to bear witness to the fact that they all owe their complete immunity from harm during their period of training to the marvellous construction and design of the Short machines, for they went at their work in true Navy fashion, and never lost a chance of going out, in wind and weather that would keep the average aviator in his shed. Consequently, their machines had to stand usage on the rough Eastchurch ground which would have wrecked anything but a Short chassis over and over again.

Certainly the ordinary engine-behind machine has certain advantages, chiefly in the possibility that a propeller is more effective than a tractor, and in the fact that an unobscured view can be had. But both these advantages can be obtained while still keeping the engine in front.

However, let us hope that ere long Mr. Seddon will again be able to go on with his work, and prove to his own satisfaction which type is really the best, for the Short Brothers are building both types.

His many friends, both in and out of the Service, will regret to hear that it has been necessary to operate on Mr. Seddon and splice the break in his thigh-bone with silver plate. Sir Watson Cheyne performed the operation successfully last week, and Mr. Seddon is now making excellent progress in a London hospital.

It would be of great interest if those who still believe in the engine-behind machine would give their reasons.

The Week's Work.

Monday, January 29th.

Brooklands.—Mr. "Partridge" out on Deperdussin taxi. Deperdussin School now in charge of Mr. H. Petre, commonly known as "The Monk." A very popular appointment, and likely to be appreciated by future pupils. Mrs. Hewlett flying well on Blondeau-Hewlett biplane. Knight doing straights on *Vickers II.*

Mr. Pizey out with Lieut. Carfrae, new pupil. Capt. Weeding, Mr. Nesham, Lieut. Smith, and Mr. Lane all doing solos, and Capt. Raleigh returned to school.

Chief excitement of day caused by Mr. S. F. Cody, who arrived from Farnborough, and proceeded to show inhabitants what he could do. Incidentally created a record by taking up four certificated aviators on one machine. Finding our three leading aviators at Brooklands, he put Mr. Gilmour in the "gallery," Messrs. Sopwith and Valentine in the "dress circle," and himself occupied the solitary "stall." With this load he started from opposite the *Blue Bird,* heading straight for Byfleet end of track. Twenty yards from railings, just as Mr. Gilmour was, according to his own account, consoling himself with the idea that rails would crumple up, Mr. Cody jerked elevator and hopped neatly over. Twenty yards further another jerk, and they jumped telegraph wires, and seemed to be going to hit banking. Just nicely in time Mr. Cody opened engine out, swung round to left, and followed curve of track, banking to about same angle. Half a mile further he opened the throttle wide, and machine shot up to 100 ft. in one jump, and after some high-speed manœuvres, landed without a bump. Mr. Valentine said he had never been on anything that felt so fast. Mr. Sopwith said it seemed to climb faster than anything he knew; and Mr. Gilmour, who then made his first flight as passenger, said, "It was a very interesting experience," which from him is praise indeed. Certainly no one machine ever carried four fliers of such class.

Later in day Mr. Sopwith brought out his 70-h.p. Blériot, and tried it against Mr. Cody for speed, opinions being equally divided as to which was faster.

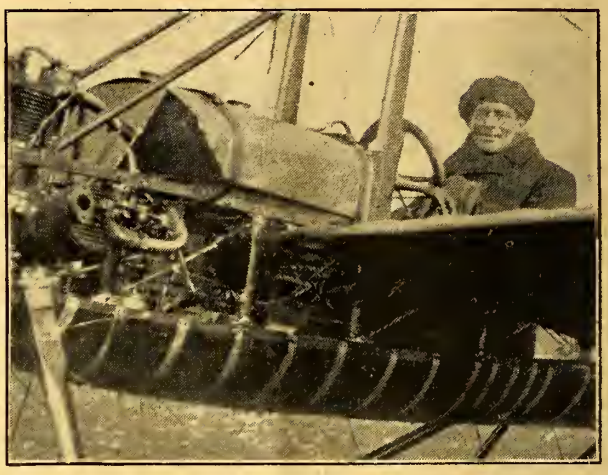
On Mr. Cody's return to Farnborough Mr. Young, of Avro School, went as passenger, and machine covered 15 miles to Laffan's Plain in 8 minutes, with strong wind behind (speed about 112 m.p.h.). Mr. Young says that, passing over Woking, he asked Mr. Cody name of town, and Mr. Cody replied, "Brookwood," as they had reached it before he could say "Woking."

As they left Brooklands Mr. Sopwith again brought out 70-h.p. Blériot to test against climbing speed of Cody biplane, and again opinions were divided, so interesting match is likely to result.

Brighton-Shoreham.—Lieut. Walter Lawrence making splendid headway with Blackburn monoplane. Put in straight flight in excellent style. Dowland continuing with tests of Collyer-England machine.

Hendon.—Messrs. Pothet and Clappen out early and both rolling straights in good style, during which time M. Desoutter made even and regular circuits at good height.

The Ewen School Team—Messrs. Baumann, Warren, Ewen, and Dubois.



Mr. "Partridge" on his Deperdussin taxi.

Tuesday, January 30th.

Brooklands.—Mr. "Partridge" out on Deperdussin taxi, and then doing circuits on brevêt machine, when magneto went wrong and he did a forced landing in the sewage farm, only breaking a strut through hitting a ridge. Very clever piece of landing, and should make first-class pilot. Mr. Gill out rolling on taxi, also Lieut. Chinnery, latter showing great improvement.

At Vickers School Mr. Johnston and Knight doing straights on *Vickers III.*

Mr. Pizey out with Lieut. Carfrae and Capt. Weeding. Mr. Merrian for solo, Capt. Weeding doing 8's. Mr. Nesham circuits. Mr. Pizey with Lieut. Carfrae and Messrs. Lane and Nesham. Mr. Merrian for certificate, but missed landing. Same out in afternoon.

Brighton-Shoreham.—Lieut. Lawrence got grip of things on new machine. Had her up for three circuits of about five miles each at an altitude of 1,000 ft., handling her with masterly precision and finishing with excellent *vol plané.* Collyer-England machine giving much better results. At Chanter School Nieuport type machine and Blériot busy.

Hendon.—At Grahame-White School Mr. Biard commenced by taking out biplane No. 3 and doing good straights. Meanwhile Mr. Turner had No. 3 machine out and made several circuits; and, finding the engine pulling well, handed the machine over to Mr. Fowler, who also made good circuits, flying well and landing splendidly. Mr. Lewis Turner out again in afternoon for several circuits.

Wednesday, January 31st.

Brooklands.—Mr. Percival out with passengers doing circuits, machine climbing splendidly. Also up alone for over an hour, only coming down for change of air. S.U. carburettor fitted, and last week's troubles apparently disappeared.

Mr. Gill out on Deperdussin taxi rolling.

Mr. Gilmour arrived on Martin-Handasyde from Hendon, having done journey in 20 mins., after losing his way and going out over Slough and back to Staines, and having speed hindered by cross wind.

Mr. Pizey out with Lieut. Carfrae and Mr. Lane. Mr. Merrian, Lieut. Smith, Capt. Weeding, and Mr. Nesham solos.

Eastchurch.—Engineer-Lieut. Randell, R.N., did some excellent flying on *Short No. 38,* his landings being especially good. He is now quite advanced enough to try for certificate as soon as weather is favourable.

Brighton-Shoreham.—Lieut. Lawrence put up another splendid flight during morning. Mounting to nearly 2,000 ft. during 9-min. circuit, he flew a mile out to sea and landed in usual excellent form. Later he made two more flights of 6 and 3 mins. respectively, landing well. Chanter's Blériots again busy.

Hendon.—Owing to severity of weather little has been done. At Ewen School Mr. Ewen on Deperdussin did circuit in very nasty wind for benefit of several visiting aviators, but on landing caught tail-skid in frozen rut and broke it.

About 4 p.m. Mr. Gilmour brought out Martin-Handasyde, and in spite of wind started off for Brooklands.

Messrs. Pothet and Clappen thought it about time they attempted something more exciting than rolling, and got off ground on several occasions, making initial flights in straight line. Mr. Hall, new pupil, took first lesson on school taxi, making pretty straight track across ground, and looks like making rapid progress. Mr. Prenssiel also out and made brace of circuits in usual steady style, landing comfortably with nicely calculated *vol plané*.

At Grahame-White School Mr. Gates out early making straights on biplane No. 3. Mr. Lewis Turner doing straights on biplane No. 2, afterwards taking out No. 3 (previously running badly) for test, found engine put in good order, handed to Mr. Biard, who put in good practice at straights.

The Plain.—M. Jullerot for trial, after which Lieuts. Harrison, Ashton and Bendall each did one solo. Mr. Hotchkiss made *début* as monoplane flyer, taking up one of single-seater machines for 10-min. flight. After this M. Jullerot took over same machine and went up for eight minutes.

Thursday, February 1st.

Brooklands.—Mr. Percival up with passengers. Pupils at Percival School out rolling, Miss Percival making excellent progress, also Messrs. Cannon and Muller.

Mr. Maurice Ducrocq testing biplane with Oerlikon horizontal engine. Apparently getting good power, though not tuned up, and able to do circuit in spite of gusty wind.

At Deperdussin School Mr. Chinnery doing straights on taxi.

At Vickers School Lieut. Beatty, Mr. Johnston, and Knight doing straights on *Vickers II*, all getting used to machine.

Capt. Weeding solo circuit. Mr. Merrian practising landing. Mr. Pizey up with Lieut. Carfrae, Mr. Nesham, and Mr. Smith. Mr. Merrian took certificate, flying and landing excellently. Capt. Weeding, Mr. Nesham, and Lieut. Smith all solos. Mr. Pizey up with Lieut. Carfrae, and then with Press photographer. All pupils also out.

Barrhead.—Mr. H. O. Walsh, new pupil, had Blériot out for rolling practice.

Brighton-Shoreham.—Messrs. England and Dowland both getting short flights. Decided to fit new propeller.

Hendon.—At Ewen School Captain Loraine and MM. Baumann and Dubois all doing good straights on Blériot, while Warren was out on the 28-h.p. Deperdussin, doing straights. In morning Mr. Ewen out for 15 minutes on Deperdussin.

All pupils put in good spell of hard work. Messrs. Welburn, Pothet and Clappen, latter two remembering successes on preceding day, increased flying distances, and Mr. Welburn actively followed. Messrs. Prenssiel and Desoutter did more circuits faultlessly, and it is exceedingly bad luck that these two, who are flying excellently, should, together with Messrs. Parr and Allen, be only held back by weather from taking their tickets with ease. Mr. Hall continuing instruction, making good attempt at rolling across in perfectly straight line, and considering short time is doing quite well.

At A.S.L. School Mr. Barber had *Viking I* out early in morning, and flew with passenger on board; very successful flights accomplished. Most striking was remarkably quick "get-off" and rapid rate of ascent.

At Grahame-White School all pupils out and did good work. Mr. Biard out on biplane No. 3, making straights. Mr. Turner on biplane No. 2 circuits, after which he took up Mr. Biard to teach turns. Machine then taken over by Mr. Fowler, who made good circuits and proved almost ready for brevêt; Mr. Gates also out doing fine steady straights. In afternoon Mr. Turner again on No. 2, doing circuits, followed by Mr. Fowler, who did several circuits at 200 ft. Mr. Gates also on No. 3 biplane, hard at it perfecting straight flights prior to commencing circuits. Mr. Biard followed him and managed half circuit, with machine in perfect control.

The Plain.—In morning M. Jullerot up on single-seater monoplane, Mr. Hotchkiss following later. Capt. Gilbert, of Italian Army, up on biplane No. 43, after which he made a fine flight on one of the school monoplanes. In afternoon Mr. Bendall took certificate, observed by Mr. Cockburn and Lieut. Manisty. M. Jullerot made short solo on biplane No. 43, on which he was followed by Capt. Gilbert. M. Jullerot then made short flight on Bristol military monoplane.

Friday, February 2nd.

Brooklands.—At Deperdussin School Mr. Gill out on taxi. At Percival School only Mr. Percival out, in gusty wind, and landed on a wing tip, but did very little damage. At Vickers

School Captain Sykes rolling on *Vickers III*.

Mr. Fleming out for tests. Mr. Nesham and Lieut. Smith solos. Mr. Fleming up with Lieut. Carfrae.

Signor Giovanni Sabelli, the latest Deperdussin pilot.

Hendon.—At Grahame-White School Messrs. Fowler, Gates, Lewis Turner, and Biard early on scene, all pupils making circuits and all showing great improvement. Mr. Lewis Turner during afternoon making circuits and landing *en vol plané* for edification of pupils.

Saturday, February 3rd.

Brooklands.—At Vickers School Captain H. F. Wood, chief of Aviation Dept. of Vickers, Ltd., out testing *Vickers II* in straights; then Captain Sykes rolling and straights, and later Mr. Johnston doing circuits right and left hand.

At Percival School, Mr. Percival out, but engine not well.

Mr. Maurice Ducrocq, testing Oerlikon engine, set fire to carburettor, and burnt fabric off left lower plane. As expected, fire extinguisher supplied to shed refused to work, and fire was put out with coats. Some day there will be a big blaze, and it will be found that local fire extinguishers are useless. Quite time a proper fire-brigade with up-to-date chemical engine was installed, otherwise all sheds will be wiped out, and present system of doors will ensure loss of machines.

In afternoon fine flying in very nasty wind by Mr. Graham Gilmour and Mr. T. O. M. Sopwith on Martin-Handasyde, Mr. Gilmour also taking up Mr. "Partridge" as passenger. Mr. Sopwith busy most of day preparing Wright biplane, but Gnôme motor very obstinate, so no flying possible.

Capt. Raleigh for solo, also Capt. Weeding and Mr. Nesham. Mr. Pizey testing, Lieut. Smith solo and Lieut. Murray, who recently took certificate at Salisbury School. Lieut. Fielding, new pupil, up with Mr. Pizey. Mr. Fleming up with Lieut. Carfrae.

Barrhead.—Since accident to Blériot when cylinder was blown off, machine has been undergoing complete overhaul, and now 35-h.p. J.A.P. has been fitted in place of Anzani. After testing Mr. Philpott took Blériot out, and after making one or two short flights was so satisfied that he continued to fly it remainder of afternoon.

Mrs. Lucking (who has been away on holiday) again joined the school and got in some useful rolling practice. Mr. Norman, who is the managing director of the company, and Walsh then did some rolling, Walsh showing great improvement, he making excellent straight rolls with tail well up.

Brighton-Shoreham.—Lieut. Lawrence essayed to fly to Eastbourne on Blackburn, with Mr. De Villiers as passenger, but series of slight mishaps prevented trip. Although Gnôme was turning over well while machine was held back, it dropped off somewhat when freed, and failed to give sufficient lift, machine, when about 12 ft. up, heeled over, sideslipped, and damaged her left wing, skid, two or three struts and tail. Fortunately both pilot and passenger escaped without a scratch.

Hendon.—At Grahame-White School pupils again doing good work, Mr. Fowler making fine circuits and landing *en*

vol plané in professional style. In afternoon Mr. Lewis Turner on biplane No. 2 for test, prior to turning over to pupils, but wind too gusty, so school adjourning to workshops for theoretical work.

The Plain.—In morning wind too rough for flying. Later M. Jullerot made two trials on biplanes Nos. 66 and 43. Capt. Gilbert scored two solos, as did Lieut. Ashton. Lieut. Bowers also did biplane flight. Mr. Hotchkiss took Mr. Roger Harrison for an instructional flight. Lieut. Bowers made his first flight solo on military monoplane, flying well at 800 ft., and finishing with perfect glide.

The Sopwith School Prepared.

Mr. Sopwith's school at Brooklands is now rapidly getting into working order. The first machine assembled on its return from the States was the 70-h.p. Blériot, on which, as has already been noted, Mr. Sopwith has done some notable flying. The Wright machine was quite ready for work last week-end, but the bad weather of Sunday prevented Mr. Sopwith from taking it out. The Howard Wright biplane and monoplane will also be in working order this week, so that by the end of the week all four machines should be prepared for tuition.

Mr. Sopwith has already had a number of enquiries from certificated aviators, who, in taking their certificates, have only had experience of one machine, and are anxious to complete their education with experience on others, and it is understood that he is prepared to make special terms with certificated aviators who wish to extend their experience in this way. The idea is a thoroughly sound one, for, of course, no one can pretend to be a finished flier whose knowledge is confined to merely taking his certificate and flying round an aerodrome always on one and the same machine.

The Possibilities of New Aerodromes.

There are rumours of the intended formation of still more aerodromes within a few miles of Charing Cross, and glowing accounts of their possibilities have appeared in the daily press from time to time. If the new grounds fulfil to any extent the promises of their promoters, then they will have justified their existence, but it would be well before going further, if those who may become interested would make enquiries as to how far new aerodromes are required. One understands that there are still some vacant sheds at Hendon and at Brooklands, both of which aerodromes are extremely well organised and arranged, and have the immense advantage that new tenants have at their disposal the experience, advice, help, and occasionally the awful example of the older inhabitants. Of course new aerodromes will be needed in time, but very great care is necessary before investing solid cash in any venture of this nature.

The Polytechnic Aero Club.

A committee meeting was held on Friday at the Polytechnic, Prof. H. J. Spooner presiding. Mr. Graham Wood announced that Mr. Weiss had offered to present him with the famous "Weiss Glider," the use of the best gliding ground in the country, and the use of the large shed in which the glider is housed, and that he had accepted this munificent offer on behalf of the club. A gliding meeting is being arranged for Easter.

Members of the club are already constructing a monoplane glider to Mr. Wood's design, so the prospects of the club seem particularly rosy. It is open to receive members, who can obtain particulars from the Hon. Sec., W. H. Emerton, 17, Glenthorne Road, New Southgate, N.

The Liverpool Aviation School.

Owing to the terrible weather in the North no flying has been done for the last month or so at the Liverpool Aviation School at Waterloo, for whenever there has been any wind there has been a thick sea fog. Mr. Hardman, the last pupil to join the school, left the ground on three successive occasions during his fourth day on the machine, and there is every reason to suppose that he will make rapid progress.

In the meantime the school has not been idle in other respects, and a large amount of work has been done in the sheds making spare parts, among these being a propeller which has given better results on a static test with the Anzani engine than any propeller previously tried. Mr. Henry Melley, the proprietor of the school, has everything ready for energetic work as soon as weather permits.

Continental Notes.

Lieutenant Scott, an American, is at Villacoublay experimenting with bomb-dropping apparatus. The aeroplane used is an Astra-Wright, fitted with a 60-80-h.p. Renault engine. The two seats are enclosed in a boat-shaped body, the framework being covered with canvas. Cellon windows are inserted in the under surface of the front portion of this compartment. The passenger lies at full length, face downward, by the side of the pilot.

Mr. W. H. Ewen at Hendon on his Deperdussin.

On February 1st a mechanic named Chapouille was seriously injured at Douai whilst starting a new motor. His muffler caught in the propeller, his skull was fractured, and his scalp torn off. He is at present lying in a serious condition at the local hospital. This accident furnishes a further proof of the need of fitting aeroplane engines with some arrangement for starting other than by swinging the propeller. There are many quite unnecessarily dangerous operations in aviation which are responsible for a large number of the accidents reported under the heading of "flying" in the daily press. Of these one of the worst examples is swinging the propeller.

Providence has a kindness for inventors, and guards their safety with a care in no degree less than the solicitude with which it watches over the destinies of lunatics and inebriates, but occasionally its beneficent attentions relax and disaster follows. M. Franz Reichelt, an Austrian, who by trade was a ladies' tailor and by inclination an inventor, has paid the penalty of overworking the patience of Providence. He devised some years ago a parachute in the form of a large hood fitting over the pilot's head, which was intended to preserve the lives of those aviators whose machines collapse in the air. His smaller experiments, in which he used a dummy, were all more or less successful. Encouraged by this, he determined to prove the safety of his apparatus by throwing himself, attached to the parachute, from the upper gallery of the Eiffel Tower. Having obtained a permit from the Prefecture of Police, though with considerable difficulty, he, in the presence of several friends, threw himself from the Tower on February 4th. Either the parachute was inadequate or failed to open properly, for the unlucky Reichelt fell to the ground like a stone. Practically every bone in his body was broken. The daily press, with ghoulish avidity, has of course added this death to their already large list of aviation accidents.

It is reported that on February 3rd, at the aerodrome of Saint Cyr, Captain Olivier Le Maguet fell from a height of 150 ft. and was so seriously injured that he died before arrival at the hospital. He began to learn to fly a fortnight ago, and had made rapid progress. In his last flight, which was only his tenth, he rose to a height of 300 ft., at which height he flew several circuits. As he made his last turn his machine overbanked and sideslipped. Captain Le Maguet was an officer of the Legion d'Honneur, and had served with distinction in Sénégal and Cochin China.

During the last few weeks at the aerodrome of Corbeaulieu the two inseparables, Martinet and Legagneux, have on several occasions indulged in shooting expeditions on an old type Farman biplane. Legagneux acted as pilot whilst Martinet sat upon an extension in front of the aviator and fired at both birds and ground game. According to report, which may or may not be reliable, they have had considerable success, and their table never lacked its quota of game killed by shots from an aeroplane in flight. On one occasion they were accompanied by a biograph operator, who managed to take an excellent film, which I understand is being exhibited in London at the present time.—Pingouin Rose.

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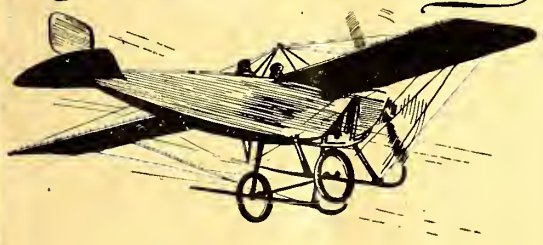

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Naval Activities.

As noted in The Aeroplane some time ago, the Admiralty are taking up the subject of naval aviation in a very business-like way, and considering that all naval aviation must, in the nature of things, be entirely experimental for some time to come, they are doubtless wise in establishing a central experimental station at Eastchurch before starting regular aviation grounds at the various naval ports, as must be done ultimately, when a definite type of machine is evolved which can be carried and handled on board ship. The appointments of various additional officers to the *Actaeon* at Sheerness for aviation duty at Eastchurch shows that we may expect rapidly increased activity before long. In addition to Commander Samson, Lieutenants Gregory and Longmore, R.N., and Captain Gerrard, R.M.L.I., it will be remembered the Lieuts. L'Estrange-Malone, and Seddon, R.N., and Captain Gordon, R.M.L.I.; were appointed recently, and last week Lieut. Spencer Grey, R.N., was also appointed. Captain Gordon and Lieut. Grey are both certificated aviators, the former being a biplane pilot, and the latter having considerable experience of both biplane and monoplane. These are thoroughly excellent appointments, both officers being not merely pilots, but men of more than average ability, possessing the daring and initiative combined with common sense which is so necessary in pioneer work of this kind. Mr. Grey has almost recovered from his recent accident, and should be flying again in a week or so, when his excellent handling of his monoplane should be seen to advantage. Lieut. Seddon, R.N., also hopes to be at work again in the Spring, and before long Lieut. Malone should win his certificate, so that by the summer the Navy will have eight very experienced fliers engaged on experimental work, and doubtless by that time many new appointments will have been made, so that Eastchurch seems to be promised a very busy year.

Austrian Naval Aviation.

The Austrian Ministry of Marine have decided to form an aeronautical station at Pola, in order that naval officers may be trained to fly the aeroplanes which are to be attached to the Austrian fleet. It is expected that though only a sum of £1,000 has been asked for in the estimates, a grant will actually be made of £100;000, all of which will be spent in the organisation of a naval air corps.

According to the daily Press the Government will purchase for naval purposes a number of Lohner monoplanes fitted with Austrian-Daimler engines. These machines, as in the case of the Etrich monoplane, are entirely constructed in Austria, a fact of considerable importance from a military point of view.—W. E. de B. W.

Italian Army Aviation.

The Engineer Corps of the Italian Army has, after consultation with the military aeronautical authorities, arranged an aviation course for the training of officer pilots. All officers who apply and are selected must go through this course. As in the British Army, only those officers who are of and below the rank of captain are permitted to apply.

Thirty officers have already been attached to the aviation sections at Udino and Malpensa. Those officers who, after a course of thirty lessons in flying, are able to pass the first degree of the military brevêt will be absorbed into the aviation corps, whilst officers showing no particular aptitude will be returned to their regiments. This course commenced on February 1st.—W. E. de B. W.

The Royal Aero Club.

The Annual General Meeting will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

At the meeting of the Committee on January 30th the following new members were elected: Brian Mawson Dodds, Alfred Dukinfield-Jones, Ronald Campbell Kemp.

The following Aviators' Certificates were granted: 176, Lieut. Alan Geoffrey Fox, R.E. (Bristol biplane, Salisbury); 177, Lieut. Eric Mackay Murray (Bristol biplane, Salisbury); 178, Giovanni Sabelli (Deperdussin monoplane, Brooklands), subject to sanction of Aero Club of Italy.

The following are the best performances recorded in the Mortimer Singer Competition:—

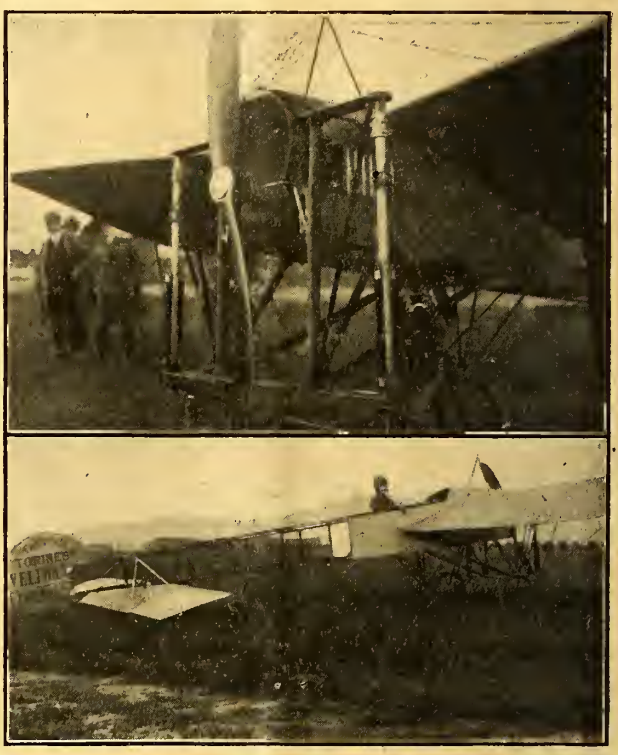
Army.—January 29th, 1912. Lieut. B. H. Barrington-Kennett, with passenger. Nieuport monoplane, 50-h.p. Gnôme motor. 111 miles.

Navy and Marines.—August 16th, 1911. Capt. E. L. Gerrard, R.M.L.I., with passenger. Short biplane, 50-h.p. Gnôme motor. 129 miles.

—Harold E. Perrin, Sec.

Italian Notes.

Since my last notes further particulars are to hand of the Government competition for motors and complete aeroplanes. The latter are to be built wholly in Italy, and preference will be given to any of the complete machines if the motor be—as is compulsory for the plane—of all-Italian build. Very few manufacturers can comply with these conditions, even were a certain foreign Italian motor-maker to set up his tent in the land; but among these will be the Chiribiri, Asteria and Faccioli concerns, all of Turin.



Two views of the Chiribiri Monoplane with Signor Chiribiri at the control.

The Chiribiri motors, which fly Blériot type machines made by the firm in several models, ranging from school to a two-passenger military, are of normal car type, giving 25, 45, and 100 h.p., the first of three and the others of four cylinders, fired by Unterberg and Helme magnetos and weighing from 3 to 5 lb. per h.p. They are, of course, water cooled.

The military machine has a torpedo-shaped look-out placed Train-wise among the chassis struts, and fitted with side door and windows. Communication from observer to pilot is via a speaking tube, the motor being stationary as regards the machine, hence silent. Photos are not available.

The ordinary 100-h.p. claims to do 165 kilometers per hour, minus passenger, of course. Paulhan himself has been at Milan recently with some of our shining lights.

Rumour states that Paulhan has been invited to start works here. The Government's preference for Nieuports has given rise to remarks of the same tone about them. The latest feather in this last firm's cap is a fine cross-country flight from Somma to Turin, inaugurating a brand-new machine, the pilot being Lieut. Palma di Cesnola (one of the recent French ticket-holders), with Lieut. Grafiani (a Pordenone pilot of 15 months' standing) as observer. Di Palma thoroughly explored Turin. Strangely enough, over-city flying by Service aviators is now allowed again. T. S. Harvey.

The New Avro-E.N.V.

Mr. J. R. Duigan, who has been experimenting with a new Avro with an E.N.V. engine at Huntingdon, has managed to get some short, straight flights out of the machine, but for the last few weeks has been held up by bad weather. As the machine is quite a new type, it probably needs trials with different propellers. Mr. Duigan says that he is extremely pleased with the engine, which runs beautifully.

The First British Hydro-aeroplane.

As so much interest is at present being taken in hydro-aeroplanes, the early experiences of Mr. Oscar Gnosspelius on Windermere will no doubt be entertaining. His machine, which was certainly the first to leave the water in this country, although it did not actually fly, is a monoplane of fairly normal design, the wings being of Blériot type, with a surface of about 190 square feet. The fuselage is of the Avro type, with a non-lifting flat tail, and elevator flaps.

The under carriage is a simple A frame, slung on ordinary rubber shock-absorbing rings, and a hydroplane float of the "Ricochet" type. This float weighs about 110 lb., being 12 ft. long, with a 5 ft. beam. Complete with a 50-h.p. Clergêt engine, but without pilot, it weighs 650 to 700 lb.

At the first trial the machine jumped off the water at once and then did a quick side slip, touched the water, and turned end over end; but Mr. Gnosspelius puts this accident down entirely to his own inexperience of monoplanes, and to the fact that he used the rudder too much. The necessary repairs included one wing and a new propeller, besides cleaning the engine. He notes that water disintegrates a propeller just as effectively as earth does.

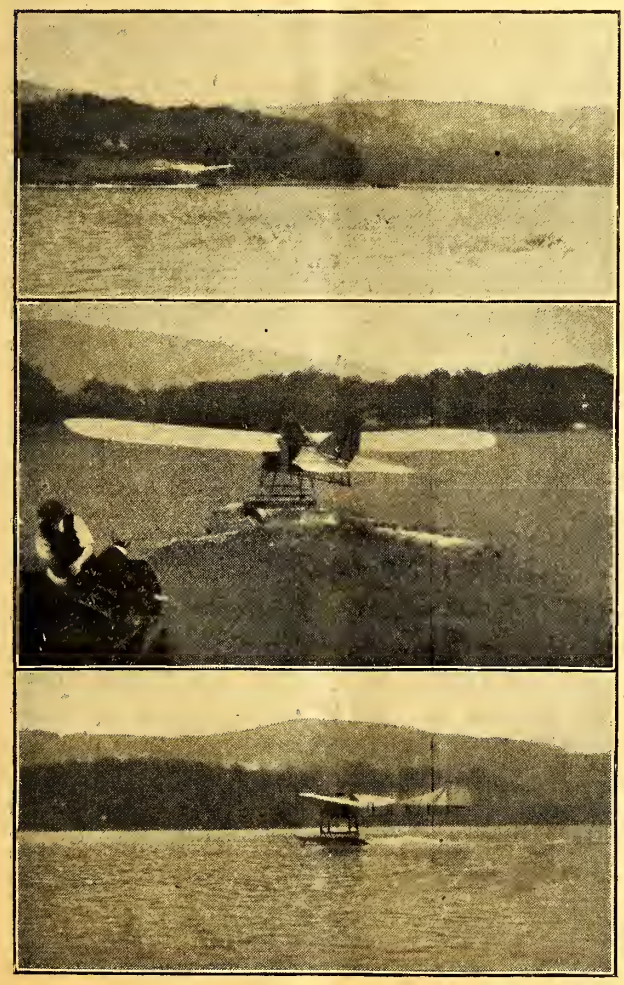
On Saturday last Mr. Gnosspelius was out again, but kept his engine rigorously throttled down. Even then the machine showed a tendency to get away very fast, and he hopes soon to be able to make short flights, having plenty of power.

He points out that one of the minor difficulties in connection with hydroplanes is that water is very soft at low speeds and exceedingly hard at high speeds.

This machine is being experimented at the same time as Mr. Wakefield's own machine, and between the two most interesting results are sure to be obtained.

Writing of his early experiences, Mr. Gnosspelius says:—"I started in 1910 with the machine as the 1911 one, but with two catamaran hydroplane floats. This never went at any speed, partly owing to a bad engine and partly as the floats were too small. At the end of 1910 I built my 1911 machine: 5 ft. by 12 ft. float from experience of a 14 ft. by 4ft. hydroplane float of Messrs. Borwick, from which I had obtained 27 m.p.h. with a 20-h.p. Alvaston and an air propeller.

Mr. Gnosspelius' 1911 machine, showing floats.



Views of Mr. Gnosspelius' 1910 hydro-aeroplane.

I immediately got better speeds, but the bumping was terrific, as I had no springs, so I had to fit shock absorbers. After some difficulty with fore and aft balance, the machine behaved very well, but lack of power prevented it doing anything more than short hops.

The new machine I have now on the old float, which seems, strange to say, very fair, though built so long ago.

I cannot help liking the Fabre type float. I don't believe the Curtiss type would ever do for a really high-speed machine, aspect ratio for hydroplanes being, I believe, as important as it is for aeroplanes.

The photographs of the new machine were taken just before the upset. I have since altered the side balancers, made them flat bottomed, and placed them higher, so that they only touch the water when the lateral heel is considerable. This facilitates steering at low speeds.

Aviation Lectures.

On Friday, February 1st, Mr. Archibald R. Low, of Vickers, Ltd., the well-known aeroplane designer, delivered the first of his course of lectures at University College, Gower Street.

He devoted the first part of his discourse to the relations between experiments in water and the corresponding results of work in air-streams, after which he passed to the consideration of the sources of error in experiments with wind-tunnels, with especial reference to Eiffel's results. He showed the extraordinary differences in the speed-power curves taken on the same torpedo-destroyer in shallow and deep water, and emphasised the fact that even in the shallow water there was seven or eight times as much proportional clearance as in Eiffel's tunnels.

He then referred to Prof. Bryan's new work (reviewed lately in these columns), and also gave some quotations from Bothezat's work on the subject, showing how the latter arrived at his final conclusion, that since no machine can be made to damp out its oscillations in less than six or seven seconds, it is possible for each of a series of gusts to hit a machine before the oscillations of the previous gust have died out, and therefore no machine can be really stable automatically. He stated, however, that these results need checking, a statement with which most students of aviation will thoroughly agree.

The Aeroplane would heartily advise all serious students of aviation to attend these lectures, which really need no recommendation to anyone acquainted with Mr. Low and his work.

Correspondence.

The Editor of The Aeroplane *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* The Aeroplane, 166, *Piccadilly, W.*

Lateral Stability.

Sir,—In The Aeroplane P. K. T. advocates the use of balancing planes for correcting a lateral cant owing to their resistance being balancable. This is just what the Bros. Wright disputed in their dealings at law with the Curtiss Co., however, but it is granted that this method is more evenly balanced than the aileron, warp or flap systems.

Unfortunately these commodities—balancing planes—can only run hand in hand with the biplane school, and the poor monoplane designer has at present to be content with one or other of the unbalanced type. I myself have got over the difficulty in a very simple way by connecting the two flaps together at the top by a thin wire, passing over pulleys on the top surface of the wing, and over the cabane. This arrangement acted even better than I thought it would, because, besides the practically equal resistance of the two flaps, I only have to work them about half as much as I did before fitting the extra connecting wire, as the flap that is in the "up" position actually helps to slightly depress the raised wing, so helping its partner in the correcting business, which is performed easier and quicker.

I must apologise for the length of this letter, and must once again thank you for the articles in The Aeroplane.

Hull. Oscar S. Penn.

A Defence of M. Védrines.

Sir,—I notice in to-day's issue of The Aeroplane a paragraph criticising M. Védrines, and as you have frequently made statements to the effect that he is ill-mannered, discourteous, suffers from swelled head, etc., and now this week insinuate that he is flying and lecturing on aviation for money-making purposes, I should be glad if you would find space in your correspondence columns for a few words on his behalf.

Having worked with M. Védrines in his mechanician days, I claim to speak with some authority, and I must say that in those days, at all events, he was not discourteous, and he certainly did not suffer from swelled head; in fact, he was well liked by most people he came in contact with, and I am writing with the approval of several who knew him.

He was a mechanician of the very first class, and, in my opinion, he owes his present position as one of the finest pilots in the world, largely to this fact. Like most Frenchmen, he is very excitable, but I can honestly say that the only occasion that I knew him at all rude was when he was bothered too much by over-inquisitive visitors to the hangars, when he had his beloved "Gnôme" in pieces, and bearing in mind the nature of the work, I think that excusable to a certain extent.

Of course, these remarks refer to the summer months of 1910, and I cannot say anything about his conduct since, but I find it very difficult to believe that he has become the uncivilised being one would infer from your remarks from time to time. Personally, I would rather think that the terrible calamity which befell him in August, 1910, when he lost his children by fire, increased the natural irritableness of a clever and highly-strung man, and I think we might all allow a little to this.

With regard to the money-making, I should like to express the opinion that there are others, and I am not sure that it is a profession that one need be ashamed of. I say if a man takes the risk he is quite justified in taking any prizes, etc., which may be offered.

In conclusion, I think if you cannot say any good of a person, say nothing, is an excellent motto, and hope these few remarks may help to give some of your readers a better impression of one who has risen from the ranks of the mechanicians to become one of our finest pilots.

Eastbourne. Charles Jarvis.

[Mr. Jarvis' defence of his former companion is worthy of all respect, and does him great credit, but he can rest assured that there is very little in common between Mr. Loraine's cheery little *mécano* many of us knew in 1910, and the lawless "star" flier of 1911-12. There are limits to all things, and the limits of common decency have been passed on too many occasions by M. Védrines, both here and abroad, for mere excitability to excuse them.

If one acted on Mr. Jarvis' advice to speak no ill if one cannot speak well of a man, this world would be even fuller of humbugs, rogues, and other undesirables than it is at present. No one has greater respect for M. Védrines' ability as a flier than has the writer, but for the welfare of clean sport it is necessary to disabuse the public mind of the impression given by the daily press at the time of the "Circuit of Britain," when paper after paper literally slopped over about his defeat, and humbugged the people of this country into the belief that he was the real hero of the race instead of Lieut. de Conneau, a gentleman and an officer of one of the finest services in the world.

So far as money making is concerned, good luck to him—but one need not pretend that his neat little schemes to advertise himself are solely prompted by a whole-souled and disinterested patriotism. Védrines as the model husband and father, and Védrines as the great French patriot, has been rather overdone, and one wants no more of him; but Védrines as the highly-paid crack flier is very welcome so long as he behaves himself.—Ed.]

The Hemispherical Entry and Other Matters.

Sir,—In reply to Mr. Goldman's letter in The Aeroplane of January 11, claiming to be the inventor and patentee of the hemispherical stream-line body, I would like to point out that as far back as 1906 I protected the idea and trotted it out to the experts with the usual encouraging results. At the Agricultural Hall in 1907 I exhibited two models with hemispherical stream-line bodies. These machines were illustrated in *Black and White*, April 13th, 1907, *The Automotor Journal* of April 13th, 1907, *The Sketch*, etc.

The late Hon. Charles Rolls, in describing the models at the Exhibition in the *Daily Mail* of April 8th, 1907, said of one of my models that it was "a most ingenious mechanical bird with steering tail and wings; the body is constructed of a special form of corrugated aluminium, likely to be extensively used in the construction of aeroplanes."

The Tribune of April 16th, 1907, in a witty account of the flights at the Alexandra Palace, said that the chief amusement was afforded by me with two bird-shaped machines made of aluminium, one fitted with propellers, the other with wings. The propeller bird flew 12 ft., turned round three times, and then struck a photographer to the earth.

It is interesting to note that these crude models, which were laughed at then, embodied ideas which are recognised as standard practice to-day. Although I am not a "Flight Pioneer" of the orthodox order, I think I may justly claim from the evidence which I have given to be the first to build and fly an all-metal machine fitted with a hemispherical stream-line body and a non-lifting tail.

I believe the gliding angle and speed of the Nieuport machine would be increased if it were fitted with a hemispherical nosed stream-line body similar to the one illustrated in *The Automotor Journal* of April 13th, 1907.

Harping back on the subject of experts, I submitted my new Duplex Rotary Valve Gear for internal combustion engines to the powers that preside over that colossal scrap-heap where the British public's money is squandered, "The Gas-bag Factory." Naturally, I expected a straightforward opinion either favourable or otherwise from such an august authority. Instead I received the usual encouraging official communication.

However, I have just had some encouragement from another quarter; a gentleman well known in the motor world in London, whose opinion on motors carries more weight than all the combined opinions of all the experts who preside over the above-named factory, has approached me with a view to purchasing all my patents on the engine for a powerful American syndicate, whose interests he represents in this country.

In conclusion, it seems to me that experts, like politicians, as a rule, succeed by having the ability to tell a good tale, and trot out quotations from some book on a subject irrelevant to the subject under discussion, just by way of showing off their superior wisdom.

Clarges Street. William Cochrane.

Theory and Practice.

Sir,—Please allow me to congratulate Mr. P. K. Turner on his conversion. His article on Professor Bryan's book must ever remove the whispered reproach that he despised mathematicians and all the ways of them.

No more will he shudder in print at the "mind master of the higher mathematics." Rejoice with me, for a technical and practical periodical has at last praised a mathematician.

Now, Sir, I want to say things. I had occasion recently to write to the *School World* (a monthly much affected by schoolmasters) to defend the practical man against the man who would give too much praise to the purely scientific man.

A most interesting article by Professor Gregory on Aviation was published, and, though I do not for one moment wish to assert that he in any way disparaged the work done by practical aviators, yet it seemed to me that he attempted to over-emphasise the theoretical work of Professor Langley and of other theorists.

My letter, published in the next issue of the *School World*, put forward a plea for due recognition of the work of aviators in the air and, besides this, asked that the mathematicians would meet the practical men and try, under the aegis of the Aeronautical Society, to work with them.

Prof. Gregory wrote a long comment on this letter in the same number of the *School World*, and pointed out that scientific men, like other men, had to live, that a great part of their time was taken up in correcting examination papers, and in lecturing and teaching to earn a living. This was in answer to my request that some mathematician of repute, such as Prof. Bryan, should state definitely the lines of mathematical investigation which private students might pursue.

Professor Bryan has now rendered a service to science and to practical aviation by his masterly treatment of the problems he has undertaken, and has made us still more his debtor by his indication of future lines of investigation.

It seems to me, then, that the situation is this. The practical man wants certain things investigated theoretically, and the scientific man wants certain theories tested practically in order that he can widen them. We want, then, a rapprochement between these two groups of people. Both of them want money to enable them to pursue their investigations.

Thus it seems that we want an Aeronautical Institute liberally endowed which will bring this about. I know how difficult it is to obtain money for aeronautical investigation of any sort, but I feel I cannot let this opportunity go without making an appeal for the co-ordination of the two branches, and if this letter meets the sympathetic eye of some wealthy man, I shall feel I have done my little bit for the furtherance of the great cause.

Epsom. CHRISTOPHER W. C. WHEATLEY.

Improvement in Flying-Machine Design.

Sir,—It is really very good of you and P. K. Turner to advise in the design and construction of my proposed monoplane, but I must point out to the latter gentleman that he misunderstands the nature of my query relating to the revised Lilienthal air-pressure formula asked for. Doubtless my method of asking was misleading. Certainly I am quite conversant with the fact that resistance to aeroplanes travelling at high velocities creates high percentages, needing the expenditure of considerable power to overcome this retardation to forward motion, the estimated formula being .003 lb. per square foot at one mile velocity, and increasing as the square of the velocity. Mr. P. K. Turner will, therefore, forgive my blunder, and kindly work out approximately the total resistances to my contemplated monoplane of torpedo stream-line form, whose thickest section is 8 ft. from the front and 3 ft. (circular) diameter. I propose the expenditure of 50-h.p. propellers 8ft. diameter.

Like yourself, I have a penchant for twin screws of moderately large dimensions, as advocated in your earlier writings, with plenty of power; the result must be advantageous in turbulent winds. The chord of the main planes I wish to reduce to 5 ft., and am as yet undecided whether to make them 30 ft. span or 36 ft. The aspect ratio is thus high. I am quite able to put higher power on up to 100 h.p., but prefer to test the 8 ft. propellers first, and increase the diameters to 10 ft. when the higher power is employed. The angle of main planes to be 5 degrees, camber 3 in. maximum of approved Phillips entry.

I hope Mr. Turner will oblige us all with that revised Lilienthal formula, or explain if the subjoined example is suitable for practicable purposes; concave surfaces, camber 1 in 12:—

Angle.	Lift.	Drift.	Tangential force or pressure.
1° ...	.434 ...	.0075 ...	.016
5° ...	.647 ...	.0566 ...	.014

If the above is rudimentary to Mr. P. K. Turner, I hope he will not forget that I am but a novice. With regard to Mr. Harry Higgins, I thank him for his best wishes, and am glad to note he is not troubling about the one-man-power machine which his remarks led one to expect was the case. Even so, one does not like to be bigoted and affirm that in the future it will never be accomplished. Wenham records that the wind lifted himself and machine from the ground, but apart from the maintenance of stability in a more perfect design, has man the power to intermittently give beats of the wings in high tumultuous winds that the gulls and other birds do in order to restore the balance? Perhaps Mr. Turner could work out a hypothetical machine, or rather, if he could lever wings up and down as in nature.

I hope you will permit me to contradict the writer of the article in THE AEROPLANE that the present machine flies in winds which no bird faces, since on more than one occasion I have fed gulls on the Thames on days when, vide your official reports of flying, wind stopped all such at the various schools, resulting in blank days.

JAMES WRIGHT.

[I must apologise to Mr. Wright for misunderstanding his query. I was rather afraid I might have done so, since I had considerable difficulty in reading any meaning into it. With regard to his new queries: the calculation of head resistance of a machine is, as I remarked before, a laborious job at best, and cannot be undertaken on insufficient data. I fear it would be useless to give Mr. Wright the Lilienthal formula, as it is only suitable for use by students who thoroughly know their subject. Lastly, even if I had leisure to spend two or three weeks in designing a hypothetical machine, I should not waste that time on a type which has been proved to be utterly impossible in the present state of our knowledge of the subject.—P. K. T.]

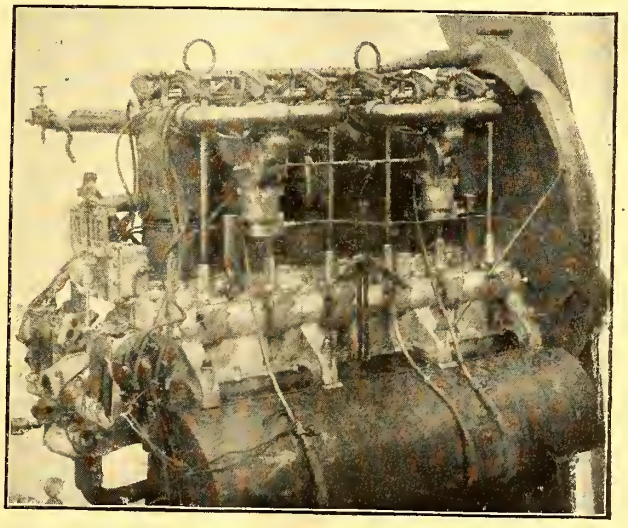
[In the matter of aeroplanes flying in stronger winds than birds, Mr. Wright forgets that in strong winds the gulls are merely hanging about in eddies set up by the bridges, or other buildings. On such days he will not find the birds flying high up or in the open, and, in the country he will find the birds sheltering in woods and behind hedges.—ED.]

Acetylene Welding.

Sir,—Referring to your assertion in connection with the Factory Biplane (January 25th, page 90), that "acetylene welded joints are apt to be very treacherous," and "that the action of the welding is apt to burn the tube," I should like to express my views on the subject in order to help remove any prejudice against this process that might have been caused by your remarks.

Naturally there are some workmen who would bungle, to put it colloquially, even a soldering job, but this fact does not reflect upon or in any way depreciate the value of this process as a means of joining certain metals. In my opinion, acetylene welding constitutes the *very best* method as yet known of joining steel, but, in common with other processes, the result is entirely dependent on the skill of the operator.

While superintending the building of a large biplane in Russia, in which acetylene welded steel fittings were exclusively used, over two hundred of these fittings passed through my hands for examination. These, I can assure you, were put to very stringent tests, and among them I did not find a single one with either a badly formed or a burnt joint. All were, indeed, as sound as if they had been stamped, were it possible, from sheet steel. That they were made by Messrs. T. W. K. Clarke, of Kingston-on-Thames, was, without doubt, enough guarantee of their exceptional soundness.



The 120 h.p. Austro-Daimler Engine and Radiator, as used by Mr. Cody.

In the case of one machine I saw being constructed in Russia, in which case this process was made use of to considerable extent, some joints had not received sufficient heat and so were not really welded at all, while others had received too much and were consequently burnt. In England here I have noticed workmen of firms professing to specialise in this process commence operations by attempting to remove all dirt and grease from the surfaces to be welded by rubbing with an already very dirty and very greasy handful of cotton waste. Both these instances come under the category of bad workmanship, and any blame which is due to the unsatisfactory result applies solely to the lack of experience or skill of the operator, and not to the process itself.

If the workman has a thorough grasp of his subject he will make the joint much stronger than the remainder of the fitting itself, which, after all, it would be impossible to attain with any other process.

Hendon. Lewis W. F. Turner.

One-Man Power.

Sir,—Pardon me if I take exception at a remark by "Harry Higgins," who talks of "the phantom one-man machine." It may interest him to know that I rose from the ground, nearly four years ago, at Oswestry, Salop, in a machine that derived its power from myself. This was done in the presence of a reporter, and a report of the machine's behaviour appeared in the Oswestry paper the following Friday. I admit I only just rose from the ground (six inches to a foot). But as it was purely an experimental machine, and first time out, I don't think it did so badly to rise at all.

Not being a rich man, and there being absolutely no encouragement given, I was obliged to give it up. But to the present day I'll maintain that the one-man machine is a possibility, and had it received the same encouragement that the engined aeroplanes had, and still have, at the present time it would be a "phantom" seen very often.

Leighton Buzzard. Clarence Rosini.

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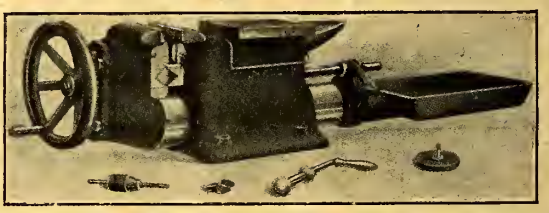

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Useful Model Work.

THE FOLLY OF MODEL-MAKERS.

On reading the correspondence in The Aeroplane—at least that part of it devoted to models—one cannot help being struck by the absurdity of many of the ideas displayed as to the scope and objects of aero-model building and flying.

For instance, in a recent letter a correspondent claimed that the object of building aero-models was to encourage workmanship. Now, if there is one advantage which aero-model making possesses as against other branches of model engineering, it is that the quality of workmanship employed need not be good. In fact, one may say that there is no scope at all for any workmanship at all beyond the most elementary: for training in metalwork the building of small-power engines is undoubtedly the best; for woodwork, the building of model boats.

As a matter of fact, the true scope of aero-model making is that it affords a splendid opportunity—I do not say necessity—for applied mathematics, that it encourages original and logical thought, and that success can be attained with but small power of craftsmanship. In fact, it bears about the same relationship to workmanship as Euclid does to mechanical drawing, with the exception that it is much more amusing.

Of course, I am throughout excluding the building of scale models. Here certainly there is scope for workmanship. But the hobby is perfectly useless, for the simple reason that if the builder is sufficiently advanced in craftsmanship to turn out anything better than the abortion usually miscalled a "scale model," he is wasting his time. True, it teaches something of the proportions of full-sized machines, but there are many better ways of obtaining this knowledge. It also occupies time which might otherwise be spent in other mischief; but here again, that time might be much more profitably spent in building simple models, from which something useful may be learnt. No! Let scale models be relegated to their proper place—a glass case in South Kensington Museum; and let them, when wanted for this purpose, be built by professionals, who do the work really well.

Meanwhile, let serious model-builders remember that their main—in fact, their only—object is to improve the two main points of the aeroplane: efficiency and stability.

Now, in spite of various statements which have from time to time been made by those interested in slow-flying models, it is obvious to any thinking mind that distance is essentially the perfect test of both these factors. It is a test of stability, because if a machine is not stable it will either come to the ground before its power is exhausted, or it will lose its direction, and so be penalised, since distance is always measured in a straight line.

As regards efficiency, distance works as follows: a rubber motor of a certain weight contains a certain amount of energy. In driving a machine of a certain weight over a certain distance a certain amount of energy is expended. The ratio of this energy to the weight (i.e., energy) of the rubber gives the efficiency of the machine.

In order to get a test in which the most efficient machine shall win, all that is necessary is to classify the machines by the ratio of elastic weight to total weight, when the longest flight shows the most efficient machine. Or an efficiency competition might be arranged, in which the total weight is multiplied by the distance and divided by the weight of elastic; the highest figure to win. If it is especially desired to encourage workmanship, the weight of the machine should be neglected, the prize being given simply for the greatest distance accomplished with a given weight of rubber. This will obviously put a premium on light machines, so that the builder whose workmanship is good will probably win, since he will get the necessary strength with less weight than his competitors.

Agitation as to size of propellers is absolute nonsense. As I have pointed out, the stock of energy in a given machine, and therefore its potential distance, is governed entirely by the weight of rubber. The propellers which use this energy to the best advantage, i.e., which deliver to the air the greatest proportion of it, are obviously the best. Therefore the obvious duty of a serious model-builder is to use the most efficient propeller, even if it seems disproportionately large or small.

It will be noticed that I say "seem." The disproportion, of which such a fuss is sometimes made, is really entirely imaginary, for the simple reason that there is no standard of comparison. It may be that the propellers are, in proportion, three times as large as those of any full-sized machine. What of it? The conditions are entirely different. The type of motor is distinct, not only in form but in principle; besides which, it is quite probable that the "full-size" designer would use propellers three times as large as his present ones, were it not that alien considerations—such as ground clearance and construction—prevent it. One might equally well demand that no model should be fitted with twin opposed motors, because few full-sized machines have them, or that all models should have a head-resistance not less than that proportional to a pilot, passenger, and engine!—P. K. T.

AN OPEN COMPETITION.

In order to impress on model-builders the importance of efficiency in models, "P. K. T." has decided to offer a prize of 10s., to be competed for under the following conditions:—

(1) The Competition is open to anyone in the United Kingdom.

(2) The model must be of the competitor's own construction and design throughout, including propellers.

(3) Several competitors may collaborate in one entry, if desired.

(4) Particulars of flights must be sent to P. K. Turner, c/o The Aeroplane, 166, Piccadilly, and must be sent in on the proper forms. These must be filled up with the weight of model in flying trim, weight of elastic used in the flight, and distance flown.

(5) The flight must be carried out in the presence of two witnesses, one of whom must be an official of an aero-model club, and the other unconnected with any model club.

(6) After the competition flight, another flight of not less than 100 yards must be made without adjustment of any kind. (This is to show that the model did not in any way suffer damage in the first flight.)

(7) Filled-up forms must be received in this office not later than first post on the morning of March 31st, 1912, and must be accompanied by a full description, sketches, and, if possible, photographs.

Forms may be obtained by writing to The Aeroplane, marking the envelope "Entry Form," stating the number required, and enclosing stamped addressed envelope.

The prize will be awarded on the following basis: The total weight in ounces will be multiplied by the distance in feet, and the product divided by the weight of rubber in ounces. The flight giving the largest result will win.

MODEL CORRESPONDENCE.

(Correspondents are reminded that space in these columns is strictly limited, and are therefore requested to make their communications as terse as possible.)

Sir,—We have read with much interest your article on "Lubrication of Rubber Motors" in last week's Aeroplane, and as you asked if anyone had experimented on the lines you mentioned, we thought you would like to know of the success that has followed on a lubricant we make similar in composition to the one suggested by you. First, we found after experimenting that some chemicals acted with soap and had just the opposite effect on rubber that you wished to get; and so, although working on the same principle, we have found a substance which, when put with soap and other materials, has a preserving effect on rubber. We put some under test last August, and we are still using the same rubber. It was taken from stock; and although it is practically worn out now, it has been used for all sorts of tests, and has come out well. But, as you mention in your article, it wants looking after. But we do not take it off the machine: we lessen the tension and coat it with fresh lubricant, and it is then ready for next time, and we do not trouble to keep it in the dark.—

Willis Bros.

Sir,—We notice in a letter by R. V. Tivy, appearing in The Aeroplane of last week, the following statement:—"The world's record for distance is, I believe, held by a machine, the propellers of which are intended primarily to use up the energy stored up in the elastic slowly. The blades are bent under steam and are absolutely flat and the aspect ratio very low. In fact, they are in every way unsuitable for use on a large scale."

Mr. R. V. Tivy presumably refers to "Mann" propellers, and, if so, we have great pleasure in informing him that

the blades are correctly cambered by our special process, which does not merely consist of bending over steam. Moreover, they have, in the course of scientific tests, proved themselves most efficient, the slip loss only being about 20 per cent., a ratio that, we believe, has never been attained by a high-speed screw. We will take it as a great favour if Mr. Tivy will inform us where he obtained his data about "Mann" propellers. Again, we consider that an aspect ratio of six is not usually thought very low in a model propeller.

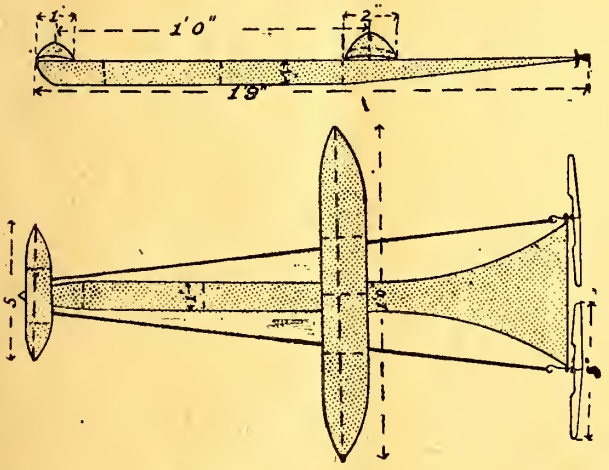
One might almost infer from the tone adopted by Messrs. Tivy, Moses, etc., that anyone could build a distance or duration model, no skill at all being required! Mr. Moses, too, seems to be labouring under the impression that a "Mann" monoplane cannot get off the ground. Any of our standard models will get off the ground like the proverbial greased lightning on our landing chassis and wheels, and fly the quarter-mile into the bargain, although they are not beautiful copies of obsolete French machines. Finally, we would like to ask Mr. R. V. Tivy and others if they have ever read and appreciated the moral of that beautiful fable entitled "The Fox and the Grapes"?

Surbiton. MANN AND GRIMMER.

Sir,—In reference to Messrs Mann and Grimmer's reply to our letter re 100 secs. alleged duration. We should like to add one or two facts. During November I received a letter from the then Secretary of the Brighton Club saying that as they had not been able to finish competitions, I had been awarded a medal for record duration flight, and a certificate for distance for my flights of September 16th. This naturally (after their official notice in THE AEROPLANE of September 21st) led me to understand that they were giving my duration flights official recognition, which says distinctly, "Believed by many to be a record for duration." This accounts for my verbal statement to Mr. Grimmer.

Why does Mr. Grimmer express surprise at my saying it was not a Mann I flew when I told him in five letters previous to Christmas, and when he advertised the fact, I wrote and asked him to withdraw same; but still it appeared, next time with a photo of the actual machine (which, by the way, Mr. Grimmer has never seen). And so I was very surprised, and saw no other way but to write and explain to the papers that it was not a Mann machine used, and also that I do not claim the 100 secs. duration as a public record? Trusting that this will finally settle the matter to the satisfaction of all concerned.—Yours faithfully, H. W. WILLIS.

Sir,—Enclosed are scale drawings of a flying model, made by myself, which I thought might interest you. At first glance one might think it to be a copy of my brother's "distinctive" model (which I believe you have drawings of), but if one looks closer one will see that the construction is very different.



I think I can safely say that there is no other flying model of this size which will cover 200 yards. Being covered in everywhere, it presents a very pretty object when flying. If you should care to publish these drawings you are at liberty to do so, though I expect you have more important writings to fill your paper than this.

Sudbury. PERCY ROLFE.

(Owing to pressure on space, many letters have had to be held over to our next issue.)

CLUB NOTICES.

N.B.—Club Notes must be posted to 166, Piccadilly, to arrive not later than first post Monday morning, and should be as brief as possible.

Blackheath Aero Club.—February 24th, general meeting, Central Hall, High Street, Peckham, 6 p.m. March 9th, point-to-point contest for members only, Kidbrook, 3 p.m. Silver cup for best flights. New members needed. Details from A. B. CLARK, Hon. Sec., 12, Manor Road, Brockley, S.E.

Paddington and Districts Aero Club.—On 3rd, Evans flying very speedy monoplane with two four-bladed propellers. On March 6th M. Canning on "Positions of planes: their relation to stability," Windsor Place, Harrow Road. New members: Brown, Lane, Davidson, Chalfont, and Holden.—W. E. EVANS, Hon. Sec.

Aero Models Association (N. Branch).—Successful social on 3rd. Flying on 9th at Bishop's Avenue, East Finchley.—M. B. ROSS, Hon. Sec.

Birmingham Aero Club.—Vale, Baker and Trykle flying during week end; also towed model glider.—G. HADDON WOOD, Joint Hon. Sec.

Hackney and District Aero Club.—Meeting on 3rd at Mill Fields. Gittas and Marmin got 1,000 ft. and 300 ft. Meeting on 10th at Hackney Marshes (Lea Bridge end): point-to-point competition. New members welcome.—B. H. LONGSTAFFE, Hon. Sec.

Brighton and District Aero Model Club.—On 3rd, Bate, Burghope, and Frost doing best. Communications to A. VON WICHMANN, Hon. Sec., "Kingsleigh," Kingsway, Hove.

Scottish Aeronautical Society Model Aero Club.—Smoking concert to-night (Thursday), 8, Lansdowne Restaurant, Hope Street. On 9th, Mr. D. N. Robertson on "Internal Combustion Motors," Institute, Elmbank Crescent. On 10th, flying at Ibrox, Paisley Road, opposite Bellahouston Park.—JOHN S. GORDON, Hon. Assist. Sec.

MODEL ADVERTISEMENTS.

THE Ideal Motor for the model builder is the Ideal Model Turbine. Weight ½ lb, ⅛ h.p. at 2,000 r.p.m. Lists, stamp.—S. SUMMERFIELD AND CO., Melton Mowbray.

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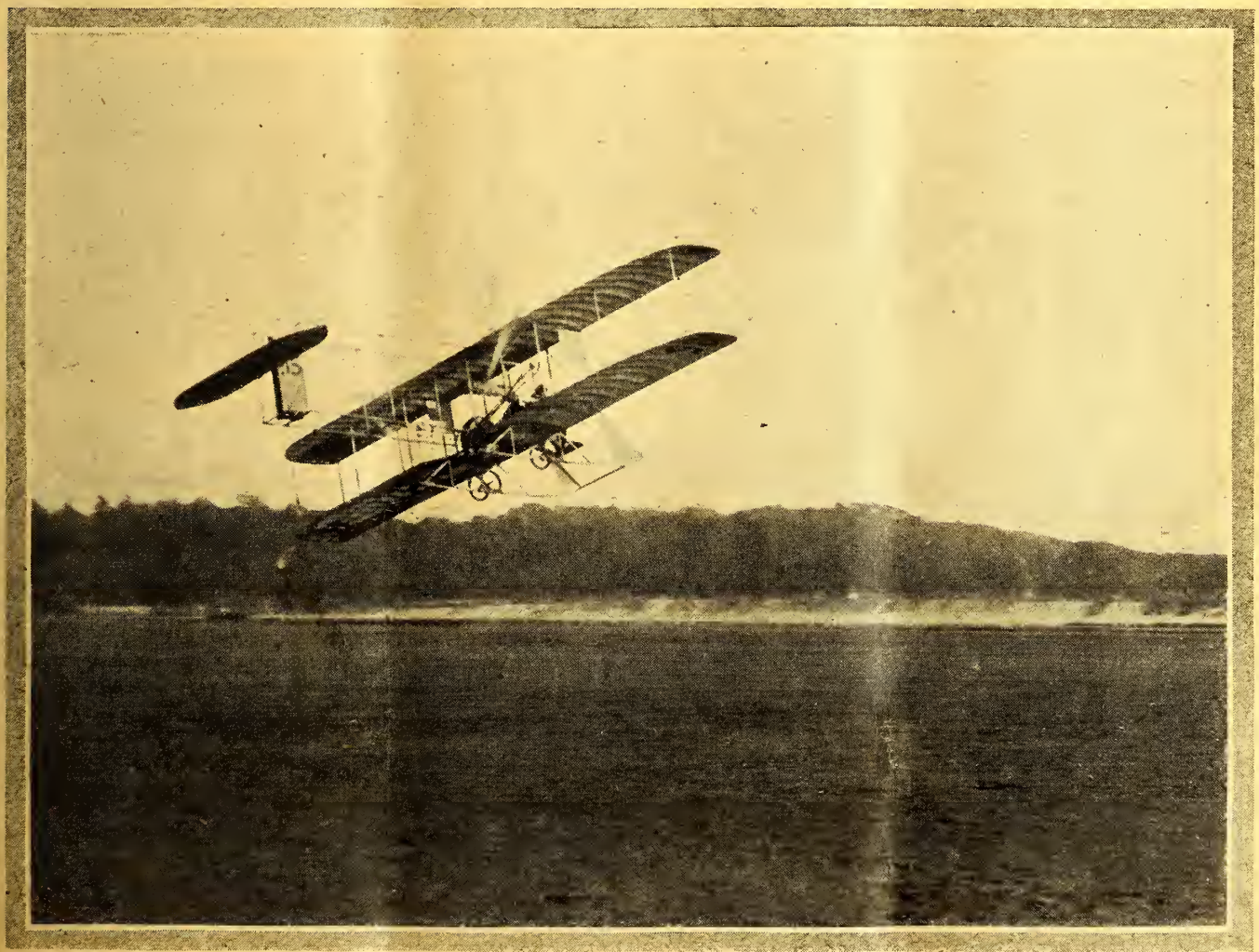
THE AEROPLANE

Edited by CHAS. G. GREY. ("Aero-Amateur")

1d WEEKLY

VOL. II. [Registered at the G.P.O. as a Newspaper.] THURSDAY, FEBRUARY 15, 1912. No. 37.

THE AMERICAN INVADER.



Mr. T. O. M. Sopwith on his American Wright starting one of his famous banked turns at Brooklands on Saturday.

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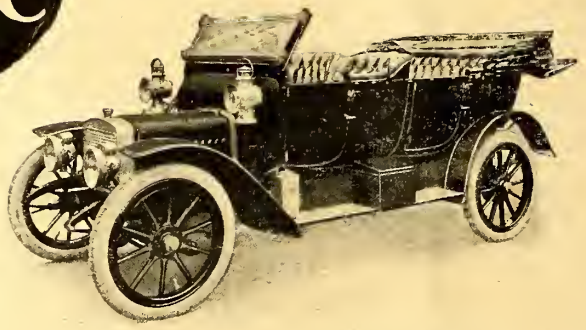

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E.H.G.

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A PLEA FOR PATIENCE.

Those who expected an immediate move on the part of the Government following on the various encouraging statements made by Lord Haldane in the House of Lords, and by Colonel Seely in the House of Commons, at the Royal United Services Institute, and to the deputation of aeroplane manufacturers, are no doubt disappointed that no practical result has yet become apparent. There is, however, no reason to be unhappy, because, as a matter of fact, much is going on beneath the surface of which little is known except to those in the inner circles of the War Office.

Parliament has not been sitting, consequently it has been impossible to elicit information by means of questions in the House, but it is doubtful whether very much information could have been extracted in any case from Colonel Seely, "that master of bland evasion" as he was recently called by one of the Conservative papers. Nevertheless, quite a lot is being done, and before many days are over we may expect an announcement of the War Office policy concerning aviation, and it is understood that this policy will be rather startling.

As has been pointed out at various times in The Aeroplane, the French Air Corps is by no means on a sound basis, despite the number of machines it possesses, owing to the lack of organisation. Apparently the British War Office is profiting by those lessons, and the General Staff has now been working for a considerable time on the perfecting of the organisation for our Air Corps, and on arranging a really big scheme to place that corps on a thoroughly satisfactory footing.

The Aeroplane is as yet unable to gather with certainty whether this scheme involves freeing the Air Battalion from the paralysing influence of the Royal Engineers, but everything points to this desirable object being attained, and it is, at any rate, certain that in the enlarged and strengthened state of the Air Battalion there must be a predominating number of officers from other branches of the Service. It is, therefore, certain that wholesale alterations are to take place at a very early date, and that the big move involved will entail the purchase of quite a large number of machines.

To Build or Not to Build.

A certain amount of doubt as to the War Office intentions has been caused by the rumour that the Army Aircraft Factory at Farnborough has purchased a number of Gnôme engines, the rumour crediting them with any number between fifteen and thirty, the idea being that each of these engines means a new machine to be built by the Factory.

As a matter of fact this can hardly be so, and, even if it were, a matter of fifteen or thirty machines turned out by the Factory would be neither here nor there when compared with the vast numbers which must be bought from outside constructors. Apart altogether from the assurances both from the Factory itself and from the War Office, that the Government does not intend to build machines in quantities, it is obvious that now the authorities have realised the importance of the Air Battalion they will not attempt to equip it from a Government factory any more than the Navy attempts to build all its ships in the Government dockyards.

In the new scheme of things the Factory at Farnborough will probably occupy very much the position of the naval dockyards, where hardly any ships are built, but where a very large amount of repairing is done; the few ships that are built there being merely put in hand to keep the men employed, so as to have them and their organisation at hand in case of a rush of repair work.

The purchase of Gnôme engines can, however, be quite easily accounted for by the fact that undoubtedly a number of Gnôme engines will be used on military machines, and it will be necessary to keep a certain number regularly in stock and in running order, so that whenever an engine in a machine goes wrong, instead of spending days tinkering with it in the machine, a new engine can be put in bodily, and the old one sent to the Factory for repair. Or it may be that the astute superintendent of the Factory having learnt from certain quarters, which modesty forbids one to mention, that Antoinette engines can no longer be obtained by those who want that make, and that rotary engines are likely to come to a natural end before very long, has decided that it will be as well to have a few in stock for replacement purposes against the time when they can no longer be obtained in the ordinary course of commerce. In any case, there is no need to be unhappy over this little purchase, though it must be admitted that the £9,000 spent in purchasing thirty Gnôme engines at the exorbitant price of £300 apiece, or thereabouts, would have been exceedingly acceptable in the form of orders to some of our British engine manufacturers, if it was found absolutely necessary to expend that sum before the end of the financial year. Still, their turn will come presently, if some of the new engines fulfil their promises.

The Bearers of the Burden.

One thing is earnestly to be hoped in connection with the expansion of the Air Battalion and the new

scheme of organisation, namely, that the valuable little band of officers who have done their best, and such a splendid best, under the most adverse conditions on Salisbury Plain, will be adequately, if tardily, rewarded. Throughout the past year, and including some of the worst flying weather on record, Captains Fulton and Burke, and Lieuts. Barrington-Kennett, Reynolds, Conner and Hynes have stuck pluckily to their work, and they deserve their reward. Flying is, after all, active service, and nobody knows it better than those who have flown themselves. Crosses of the Legion of Honour are given almost every week in France to officer pilots, and over here the Admiralty has already shown its appreciation of good service by the promotion to Commander of Lieut. Samson, R.N. Let us hope that the new organisation will include similar well-merited rewards for the men who have done the work in this country.

Taking things all round, it is fairly safe now to prophesy that in a very few months from this date the aeroplane constructors of this country will have as much work in hand as they can possibly tackle. That is, of course, aeroplane constructors who can really make a decent machine, for there are those at the War Office who know the difference between a good machine and a bad one, and if a manufacturer cannot show that his work is up to the highest standard, it is no good his grumbling because he has been passed over in War Office orders. In no branch of the Service is perfection of workmanship more necessary than in military aeroplanes. If a man is given a bad horse he can always get off and walk; if a man is given a bad bayonet he can at least sail in with the butt, and the bayonet may come in handy afterwards as a toasting fork or cork-screw; but a bad aeroplane means sudden death and nothing else, and cannot be tolerated at any price.

All things considered, the prospects of the aeroplane trade have never looked brighter than they do at the present moment, but, nevertheless, it is not yet time for the supporters of our aerial defences to relax their vigilance, and it is to be hoped that those who have supported The Aeroplane in its crusade for an efficient scheme of aerial defence will continue to do so till that object is actually achieved, and our air fleet is a fleet in being.

NERVES.

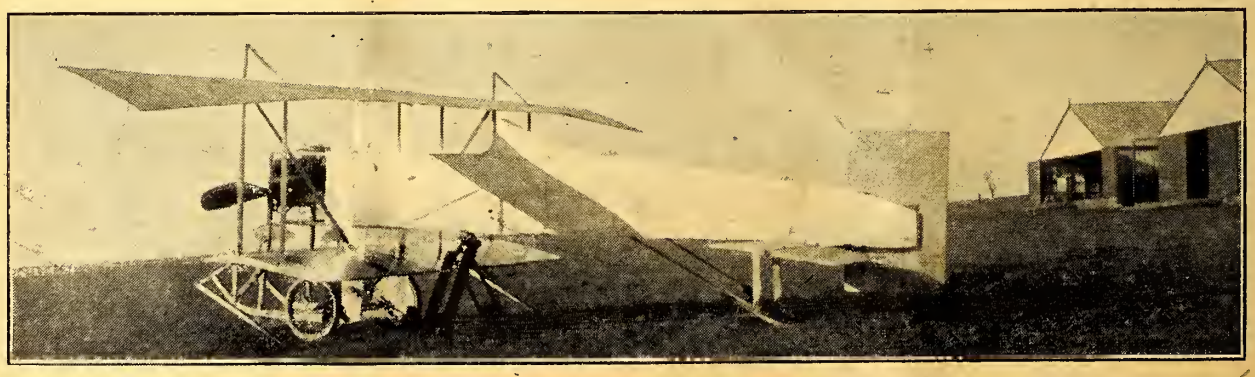
There is one problem before those who are mapping out the new organisation of the Air Battalion which needs very careful consideration; that is the question of nerves. In raising this subject it is not intended to convey the idea that flying is such a terrifying business that human nerves cannot stand it, but it is an undeniable fact that in men of certain types their nerves do give way after a period. In fact, certain civilian aviators have enunciated the theory that a man cannot go on flying regularly for more than twelve months, for at the end of that time his nerve breaks, and it becomes dangerous for him to fly at all.

This is true of a certain type of man, and in the writer's experience the man whose nerve goes is he who starts flying in a spirit of happy ignorance as to the why and wherefore of his machine, being merely content to fly more or less by instinct. This man is very often a first-class flier, but never really flies with his head.

On the other hand, one finds men who openly admit from the very start that they are afraid of flying, that they are afraid of their machines going wrong in the air, that they are afraid of what may happen on landing, and, in fact, give one the impression that they have no nerve to begin with, and yet a man of this kind will go on flying year after year without accident, and without in any way going off his form, the reason presumably being that having no nerve at the start he never loses it.

Now, as a matter of fact, there is nothing very extraordinary in a man losing his nerve over flying. Any hunting man knows others who will be in the first flight for a season or two, and then either give up hunting altogether or become hopeless roadsters. Cases have even been known of cavalry officers whose nerve has gone so badly that they are afraid to ride at the head of their squadrons for fear of their horses coming down and being ridden over. Naval men also know how after a period of hard work on torpedo-boats or high-speed destroyers a man's nerve will break completely. The problem, therefore, before the organisers of the new Air Battalion is how to select officers whose nerve will last.

The system of seconding officers for a short period from other regiments is objectionable, as it deprives those regiments of officers, and, therefore, makes it difficult for candidates for the Air Battalion to obtain the necessary recommendation from their command-



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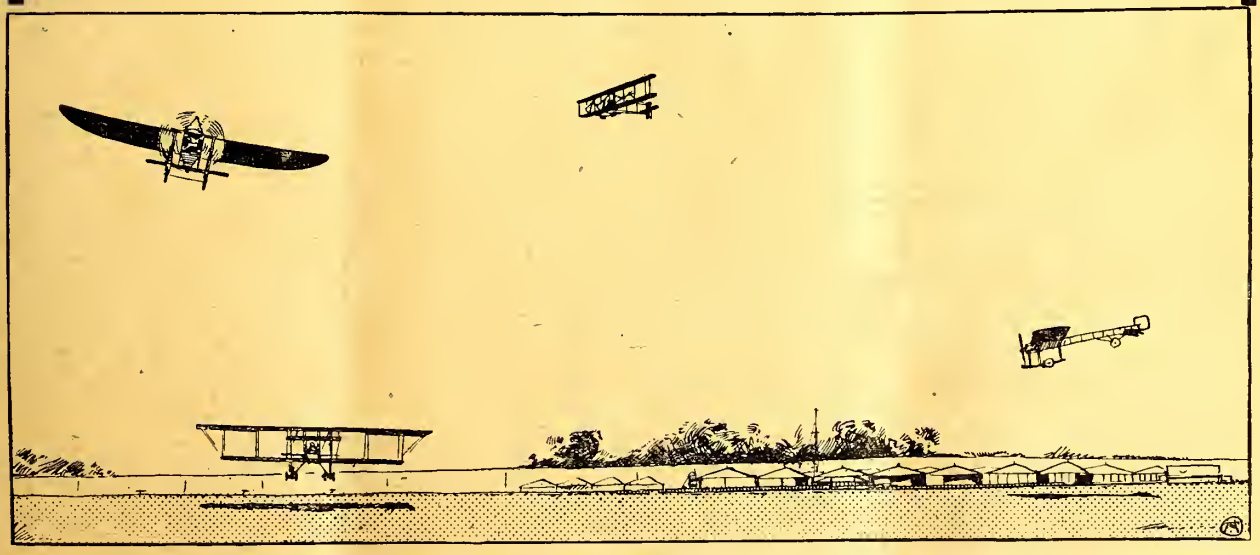


The SOPWITH SCHOOL MACHINES: Blériot; Howard Wright Biplane; American Wright Biplane; Howard Wright Monoplane.

ing officers when applying for attachment. On the other hand, if an officer is seconded for over a year, another officer is appointed to his battalion to do his work, and he can remain seconded as long as may be desirable. This, of course, should remove the regimental commanding officer's objection.

A Possible Course.

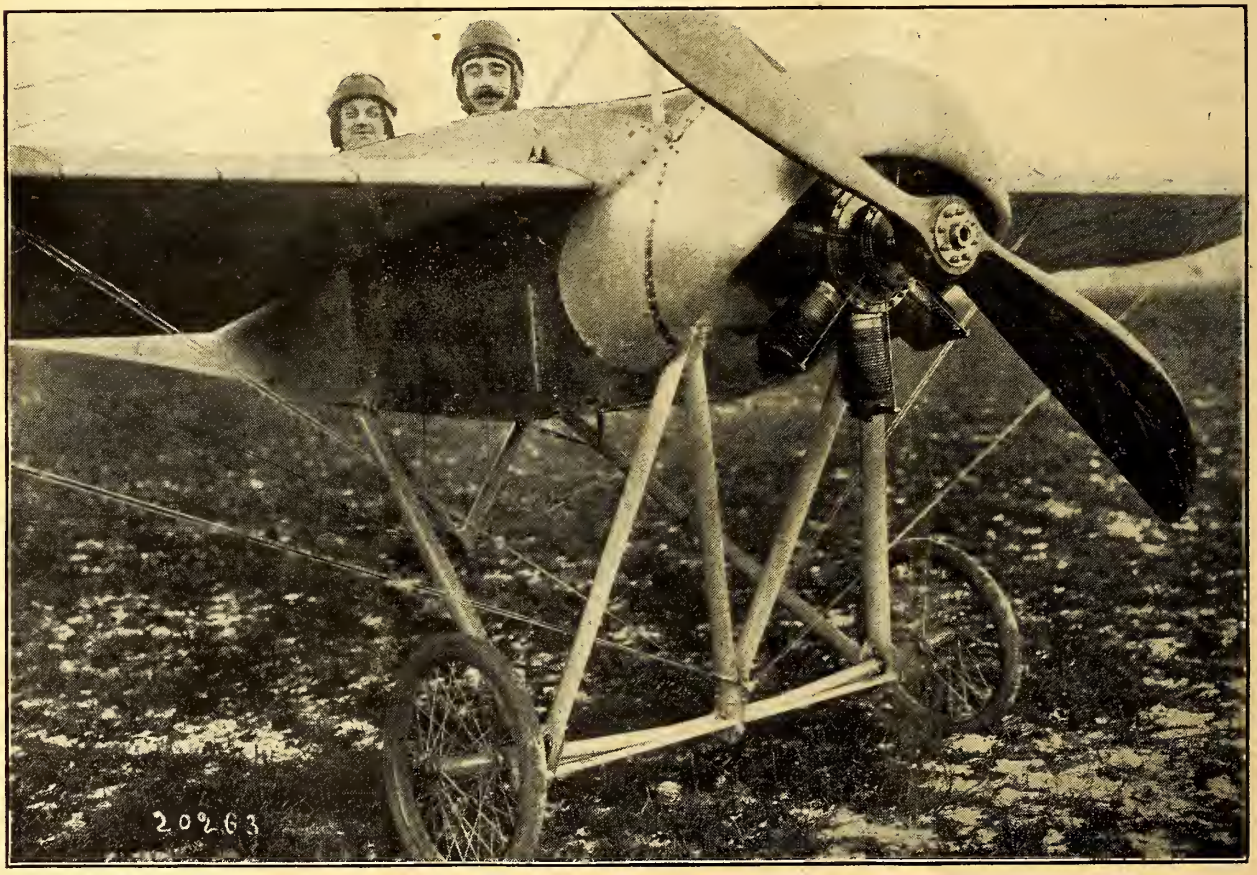
It therefore seems that the only possible thing to do is to attach every officer to the Air Battalion for a period of, say, eighteen months, so that his battalion will not suffer owing to being short of an officer, and in that period of eighteen months it will be found without possibility of doubt whether that particular officer is fitted to go on flying or not. If not, he can rejoin his battalion at the end of the time, and if he is found fit to continue he can still remain seconded, unless he should finally elect to transfer into the Air Battalion permanently.

It would, of course, obviously be better if Air Battalion officers were appointed direct from Sandhurst or Woolwich, so that all their interests should centre in their own battalion, but this system would have the objection that in the event of the nerve of any of these officers giving way they would have no other place in the Service. It could, no doubt, be arranged that any young officer joining direct should only be attached to the Air Battalion for a probationary period of twelve months, so that he could, if necessary, be appointed to another regiment if found unsuitable, but it is to be feared that such a system might lead to the branding of unsuccessful probationers, and make the rest of their life in the Service exceedingly unpleasant.

On the whole, therefore, it seems that the best system is the seconding of officers from other regiments for a lengthy period, for if they ultimately elect to rejoin their own regiments they can always claim that their return is due to the fact that after having tried both they prefer their ordinary work. In any case, this question of nerve is one which demands very careful consideration by the authorities responsible for the personnel of the air corps.

An Aeroplane "Liner."

It is announced from the United States that two gentlemen possessing euphonious names and ingenious and inventive brains have produced from the fulness of their knowledge an aeroplane on which they estimate eight or ten passengers may walk about with ease in the course of a flight. It is to have four propellers, driven by two 60-h.p. engines. These propellers are also intended on occasion to give direct lift as on a helicopter. The planes are arranged on Professor Langley's principle—that is, one behind the other, a tandem monoplane in fact. The length of the entire machine is only 34 ft. No particulars of the span are given. A platform is built under the main planes 30 ft. long by 20 ft. wide. On this the passengers walk if they so desire. A gentleman, described tersely in the *New York World* as "Billy Gibson, of the Fairmount Athletic Club," is, in company with other men of means, interested in the building of this aeroplane. It is expected by the inventors that their first flights will take place in April. Human credibility is great, and the faith of the average American in things mundane is pathetic. In this country, so long as the American Press continues in this manner to add to the gaiety of nations, we have no right to complain.



THE LATEST MORANE-SAULNIER TWO-SEATER.
The arrangement of the engine cowl should be noted, but the particularly ingenious point about the machine is the springing of the wheels in the steel tubular chassis struts.

Aviation in the Navy.

By W. E. de B. WHITTAKER.

It is universally admitted that the principal use of the aeroplane at present, and for some time to come, is as an implement of war. Aviation has as definite a place in the organisation of a modern army as has any other arm, though naturally not in so advanced a stage of development.

The organisation of war in so far as the land is concerned demands the use of aeroplanes, whilst the art of war has not yet been modified by their practical use. They have been used in manœuvres several times, and on some occasions in an actual war, and in both cases with unqualified success. Their future employment in land warfare is assured, and the lines on which they will be employed are known. But so far no very definite steps have been taken to determine their position with regard to naval warfare.

The aeroplane has no official place in the fleet and no preparations have been made for its employment at sea. In several countries naval officers have been trained to fly in the ordinary civil or military schools, and on occasion they have competed in public contests with distinction. Experiments have been made with hydro-aeroplanes, but chiefly by civilian manufacturers, and always on calm water. Two successful flights have been made from the decks of men-of-war, and one descent has been made on the deck of a ship.

Eastchurch, in Great Britain, Dantzig, on the Baltic, and Fréjus, in France, are equipped as naval aerodromes, and in the French Navy the *"Foudre"* is allotted to the future naval air corps as mother ship. Beyond this little has been done.

Personnel.

The size of the British Navy in comparison with the restricted area available for recruiting makes the question of personnel one of extreme importance. The Navy is so lamentably undermanned both in officers and men that the Admiralty are chary of detaching even a small number from their present duties for experimentation in a new and, so far as the Navy is concerned, untried science. Aviation demands at present the entire services of those engaged in it, and one can hardly expect the authorities to detach for this duty officers who have undergone a long and expensive training in the varied sciences required in the management of a ship-of-war.

There has been for some years an agitation in high quarters for the disbandment of the Royal Marines on the score that conditions have so changed that there are not sufficient duties to keep them actively employed. Sentiment and the memory of the past brilliant services of the corps has so far stayed the hand of the Admiralty, but there are persistent rumours of an almost immediate dissolution of the entire corps.

Why not utilise the Royal Marines as a recruiting ground for the naval air corps? The marine officer is eminently suited for aviation work. He has a sufficient knowledge of sea conditions to make him a perfect naval scout, and he has at the same time a greater acquaintance with military practice than any naval officer. The air corps could either be a branch of the Royal Marines, or, better, a separate organisation drawing on the Marines for personnel. Such naval officers as have qualified as aviators would naturally be embodied in the new corps.

So far, though certain officers have been taught to fly and are attached for aviation, no men have been trained in the management of aeroplanes and aeroplane engines, though I understand a number of men are to be trained shortly. Would it not be well, before taking further steps in training, if something was done in the way of organisation? Any arrangement of the moment can only be of a temporary nature, that, at any rate, we may not be hopelessly outclassed in the present by foreign navies.

Presumably when matters settle down aviation will be as definite a course at Osborne as engineering or navigation, and cadets will be selected for the aerial service if they show sufficient aptitude. The aviation course at the naval colleges would probably include all the parts of the science of aviation with the exception of actual flying.

There are many theories as to the best methods of using aeroplanes at sea. One class of theorist assumes that it would be of advantage for each ship to have its own aeroplanes, which could be launched into flight from a platform erected in the forepart of the ship. These aeroplanes would be fitted with floats so that they might alight on water, whence they might be hoisted inboard. The theorist assumes that the value of the information gained by the aerial scout would counter-balance any damage done in the alighting and hoisting operations.

There are certain very clear arguments against these points of view. Firstly, the amount of room occupied by an aeroplane on board a man-of-war would render it extremely inconvenient even on the ordinary cruise. Secondly, the erection of a platform on any part of the ship suitable for the purpose would seriously restrict the radius of action of some of the ship's guns. Thirdly, an aeroplane could not return to its ship during a battle owing to the importance of not hampering the movements of that ship in any way. The concussion caused by the firing of heavy guns would also affect the flying efficiency of the aeroplane as it drew nearer to its ship.

Further, it is admitted that aeroplanes will fly in higher winds at sea than would be possible on land, and therefore they would frequently be flying whilst the sea surface was by no means calm. A naval aviator alighting in a heavy sea would be in a very dangerous position, as not only would the salving of the aeroplane be almost impossible, but the rescue of the pilot himself would be a matter of extreme difficulty, and if he were not picked up the information in search of which he went into the skies would be irretrievably lost.

Special Conditions.

It is more probable that a ship will be designed and built specially for aeronautical work, with a flying deck or superstructure clear of all obstruction. To permit of this it will be necessary for such a ship to be propelled by internal combustion engines of, for instance, the Diesel type. With this type of engine the exhaust pipes can be submerged and there are no smoke stacks to break up the flying deck. From this deck aeroplanes can rise, and with practice descents could also be made with some degree of safety. Cables laid loosely across the deck are sufficient deterrent to prevent the aeroplane from running too far after touching.

Amidships a section of the deck may be constructed in such manner that it can be used as a lift by which aeroplanes can be let down to the lower deck for storage. The defences of the ship will be a battery of 12-pounders placed on the lower deck.

It will also be necessary to build a structure forward between upper and flying decks from which to con the ship.

In attendance it would probably be advisable to have a torpedo boat destroyer fitted for wireless telegraphy, searchlights, etc. Naturally the aeroplanes used in connection with mother ships of this type would be fitted with floats that they might arise from and alight on calm water and be buoyant in case of an involuntary descent into a heavy sea.

The principal use of an aeroplane in naval warfare will, as on land, be for purposes of reconnaisance. From a height of one thousand feet the radius of vision at sea is thirty-three miles, a sufficient range for all practical purposes. An aeroplane would be able to give ample warning of an opposing fleet by merely cruising about above its own fleet at the height of a few hundred feet.

In the case of the bombardment of a coast town, work of great value could be performed by naval aviators in the discovery from above of masked batteries and weak points of the coast defences.

The question of the dropping of bombs from aeroplanes is important, but at the present moment there is no explosive of sufficiently high power in relation to weight to do any considerable damage to battleships, though much might be done against coast towns. Again, it will be necessary to devise some apparatus that one may be able to take aim and release the bomb with sufficient accuracy to hit an object of the size of a battleship from a height of two thousand feet. In any case, it is a wasteful method of doing damage, as the aerial disturbance set up by the explosion would almost certainly cause inconvenience and possible damage to the pilot.

Little is definite in the Army as to the uses of the aeroplane in warfare, still less in the Navy; but the former has at least a solid base from which to work. Only experience under actual sea conditions can teach the necessary lessons. Calm harbour water provides conditions differing but little from those pertaining to work on land. There is no reason why innumerable experiments should not be made, for it is notoriously easier to obtain grants for the Navy than any other Deparment.

All these questions will resolve themselves in the course of time, if only steps are taken to form an elastic and efficient air corps for naval work. Nothing can be done without money, but with a sum of money equal to that wasted last year on the Barrow dirigible quite a number of useful machines could be purchased and a sufficient corps of aviators trained to form the nucleus of a very useful naval air force.

AIR CURRENTS.

The Time is Near.

(Dedicated to the Opening of Parliament.)

'Tis said that, once, a Personage
Who'd heard much talk of flying
Woke up one morn determined quite
To try that day to see a flight
Or perish in the trying.
(The Person's name? I'll tell you—hist!
Observe page 5B, Army List.)

So summoning his trusty aides
(A Personage has plenty)
He braved the battle and the breeze,
Said "First return to Farnb'rough, please,"
(*Some* call it *Far—Niente!*)
And sought the place which some report as
The Army Aeroplane Headquarters.

He tapped, he rapped, he shouted and
He beat upon the door
(He also rang); till by-and-by
Languorously a sleepy eye
Peeped from an upper floor.
It was with something of a shock
He heard the words, "Wot oh! old cock."

The Person said, "Go, seek your chief—
The Commandant, I mean;
And when you run across him you
Can tell him that I'd like to view
Him flying his machine.
No ceremony; I but ask
To see him at his daily task."

"Oh, crikey!" said the slumb'rous one,
"'Old 'ard; I'm coming dahn, Sir:
You've never travelled 'ere by train
To see 'im fly an aeroplane?"—
Was what he got for answer.
"The Commandant! Oh, strike me pink!
Go *flying*! Ho yuss, I *don't* think!

"The Commandant can't fly, not 'e:
The Adjutant can't, neither.
The rest of them's the same as these,
Leastways, the ones as is R.E.'s
Can't aviate, sir, neither.
'Wot do they do, Sir?' 'Eavens! Why,
They *Lectures*, Sir, on 'ow to fly!

"I've 'eard some say as there's a place,
Ah! Salisbury Plain, the name is;
Where orficers goes in the air;
Though wot they does when once they're there
Beats me, and wot their game is.
But 'ceptin' two, from wot I 'ears,
They ain't the Royal Engineers."

The Personage went home and thought
And frowned and thought again;
And other thoughts pursued those thoughts;
And yet more thoughts of kindred sorts
Came swiftly in their train.
I'll just confide to you this *one* thing:
That Person's thoughts will come to something.

AERODROME TYPES.

No. 6.—"THE BORROWER."

It begins with a screw and a nail and enlarges to a box of screws and a box of nails, because "I'm not *quite* sure of the size"; then screws and nails being no use without a screw-driver and a hammer, they follow suit. Unless you are very firm-minded the whole contents of your shed will follow in due course, including possibly even yourself. "Do you mind lending me a hand, old chap?" and so on.

If only he were not so good-tempered about it all—but the engaging smile with which he asks favours of you would melt the heart of an iceberg, and short of feeling an absolute bear, it is impossible to refuse him. He would make quite a good example of rampant Socialism, since he exists on the maxim that "What's yours is mine, and what's mine is my own." It never seems to occur to him that there *are* things which you would not lend even to your best and most deserving friend; his own things—which, by the way, are scarcely ever worth the borrowing, are so entirely at your disposal. All the same, the fact that you are at perfect liberty to use his hypochrondriacal motor-bicycle is no compensation for having the steering gear of your new 14-16 Panthard apparently permanently dislocated through his having mistaken a ditch for the roadway when conveying a happy party stationwards.

Then again, just on the very day on which you have indulged in a new fur cap and gloves to match, of course he invites a pretty girl for a flight and rushes over to borrow them for her use. The fact that she forgets to return them doesn't concern him in the least. "Oh, didn't she bring them back? So, sorry! I'll be seeing her again in a day or two, and I'll get them for you." Apparently, however, he never does see her again, or else they are both in a dark conspiracy to deprive you of your hard-earned belongings. One cannot keep *on* asking for things, although he meets your stammered inquiries in the most charming way, as though it gave him pleasure to listen to you.

At length, when he has borrowed all the loose impedimenta in your shed that he can find, and yourself into the bargain, in order to repair his own exceedingly hybrid "bus," he gives up the job in despair for the time being and decides to borrow your machine instead.

In vain you rack your brains for adequate and reasonable excuses. He seems to think you are wasting your time talking, and, waiting patiently until you have finished, remarks blandly, "Then I'll come round in about half an hour, and perhaps one of your men will give me a hand at starting up." You depart filled with wild schemes of losing the key of the shed, burning up the whole concern, or at any rate putting your machine sufficiently *hors de combat* to prevent your worthy friend using it; but all to no purpose—Fate is one too many for you every time.—D. M. H.

Aerial Advertising.

An American aviator proposes in the spring to make a transcontinental flight from New Orleans to San Francisco, with a charming Washington girl as passenger. He intends to utilise his machine (which may be described as a Farman with variations) as an advertising medium, by distributing from the air circulars relating the health-giving properties of a particular brand of mineral water, the trade mark of which will be conspicuously painted on the wings of the aeroplane.

Such a truly practical thought is worthy of further development, and we understand that a prominent firm of manufacturers, desirous of bringing the merits of their "Flasho" metal polish more fully before the public, have acquired a large and venerable box-kite, the wings of which are to be tastefully adorned with pictorial advertisements for a similar purpose. A special point will be the distribution of coupons over various districts, and as it will probably take the pilot all his time to manage the machine, a leading society beauty has kindly undertaken to accompany him in order to attend to this part of the business. Anyone collecting 5,000 coupons and forwarding them to the makers, with a nominal sum of 2s. 6d. to cover packing and postage, will receive a full-sized threepenny tin of "Flasho" absolutely free of charge.

Mr. A. Loftus Hyman, recognising that the general backwardness of the British nation is largely, if not wholly, due to the fact that the products of the Pocahontas Packing Co., of Chicago, are practically unknown in this country, is undertaking a tour of the United Kingdom in a tailless machine of the biplane-front-elevator description, in order to enlighten the population of these islands as to the superlative merits of the delicacies in question. The American Eagle, the Stars and Stripes, and a coloured portrait of Pocahontas in full Indian costume will be emblazoned on the planes, and the engine will be silenced in order that selections by Sousa's band, rendered on an exceptionally powerful gramophone, may herald the approach of the machine, while a celebrated prima donna from the Opera House, Paris (Texas), will heave samples of the company's canned goods at anyone who gets within range.

In order to demonstrate to an ungrateful public the benefits they enjoy under our present system of government, it has been suggested that a carefully-selected assortment of Cabinet Ministers, ex-ditto, leading politicians of all parties, and permanent officials of various departments of State, shall be securely packed in any aerobus, dirigible, spherical balloon, or other aircraft of any kind, sort, or description which will carry them, taken up to a height of not less than ten thousand feet, and gently but firmly dropped overboard.—M. L. E.

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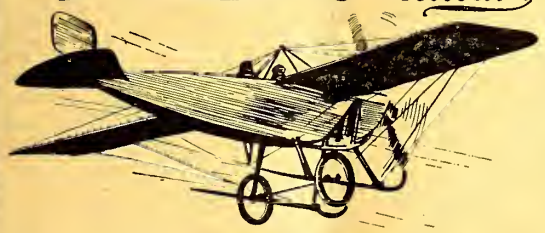

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The Future of the Aeroplane from the Lessons of Nature.

By JOSÉ WEISS.

I have found experimentally with my gliders, some years ago now, that the relation of weight to surface, as a speed-giving factor, is not a direct relation, but follows the power $1\frac{1}{3}$ or 1.33 of the surface. In other words, the load, as we would express it by $\frac{\text{weight}}{\text{area}}$ or $\frac{P}{S}$ means nothing: the load which matters is $\frac{P}{S^{1.33}}$

The same peculiarity exists in all soaring birds, where this $\frac{P}{S^{1.33}}$ is an absolute constant, its value in all soaring birds (that is, in the metric unit where P is kilogs. and S square meters) being almost exactly 8. For instance, to quote two extremes, the $\frac{P}{S^{1.33}}$ of the swift and of the albatross are identical, but the $\frac{P}{S}$ of the swift is only one quarter of the $\frac{P}{S}$ of the albatross, the swift carrying 2.5 kgs. and the albatross 10 kgs. per square metre. Now, as we have no reason to suppose that the speed of the albatross is double that of the swift, which from KSv^2 would be required to support four times the weight, we must conclude that the KSv^2 formula is useless when applied to flight. I may mention, as showing the vagaries resulting from its use, that a French experimenter (M. Tatin, I believe) found from some laboratory experiments on small vanes that the value of K did not exceed 0.04 (metric unit), whereas the late Captain Ferber could not account for the lift of his man-carrying glider unless he gave K a value of 0.7. Only seventeen times more!

I am not aware that anyone besides myself has ever made systematic experiments in free flight with several gliders of exactly the same type but of graduated sizes. I have made them of all sizes, from less than 1 lb. up to a man-carrying glider, and there is no doubt whatever that to obtain the same speed and generally the same results with two gliders of different sizes the weights must be proportional to the power 1.33 of the surfaces; in other words, the lift produced at equal speed follows not S but $S^{1.33}$.

Although we have such a ponderous authority as Newton for KSv^2,* logically it seems contradictory to assume the lift to be proportional to surface, because the lift is of necessity the result of the displacement of a volume of air, and a volume of air has three dimensions, whereas a surface has but two. If the value of that third dimension was proportional to the other two, then the weights would follow the cube of the linear dimension of the glider, which we know is not the case; and this is not to be wondered at in a fluid as subtle and as elastic as air. Basing myself on experimental results, and on the observation of nature, I submit that the value of that third dimension, the existence of which seems a logical certainty, is the cube root of the surface and the volume of air involved in the reaction corresponds to $S \times \sqrt[3]{S}$, which is the same as $S^{1.33}$.

Now, in the same way as the weight of all the best flyers of nature is invariably equal (in the metric unit) to $8 \times S^{1.33}$, we find that in all the best existing monoplanes the load is very much the same. It is only in the case when great speed is required and where enormous engines are fitted that this load is exceeded, and then only by 15 or 20 per cent. at the outside.

We can conclude, therefore, that the optimum load and the one most economical of h.p., is $8 \times S^{1.33}$. In a forthcoming article on the relation of load to speed, I hope to give an explanation of this fact.

I also believe from a comparison of the h.p. to weight in small birds to the h.p. to weight in large birds, and also from a similar comparison between the lightest and heaviest aeroplanes known, that the h.p. required for flight is not proportional to weight, but to surface, as long as we remain within that optimum load, and that therefore, by increasing the size of our machines, we obtain an ever-increasing economy of power. Just in the same way as a rook carries 1 lb. of weight with very much less h.p. than a sparrow, and again a large vulture with very much less than a rook.

If we thus base our estimates of power for very large machines on observed facts, regardless of a theory which in its present embryonic state is quite unreliable, we find that the power required to fly an aeroplane loaded at the optimum rate of $8 \times S^{1.33}$ is about 2 h.p. (nominal petrol engine) per square metre of surface, assuming, of course, the machine to be of fair efficiency, and that by fitting $2\frac{1}{2}$ or 3 h.p. we have a reasonable amount of spare power.

* Newton did not connect the formula with flight.

The following table will facilitate comparisons with existing machines:—

Surface in m²	Optimum Weight based on $8 \times S^{1.33}$ in Kilograms	Kilogram. per m²	H.P. at $2\frac{1}{2}$ per m²	Kilograms per h.p.
10	172	17.2	25	6.9
12	216	18	30	7.0
14	268	19.1	35	7.6
16	320	20	40	8.0
18	376	20.9	45	8.3
20	424	21.2	50	8.5
25	584	23.3	62.5	9.4
30	736	24.5	75	9.8
40	1,080	27	100	10.8

Before I show where all these figures lead I wish to point out why I so strongly advocate an attempt at much larger machines.

I maintain that outside military requirements the commercial future of aeroplanes is a perfect blank, unless we use them in the same way as we use railways, that is, in the shape of a public service for the conveyance of passengers, of light goods, and of mails.

The possession of an aeroplane, from the point of view of usefulness, is as impracticable to the private owner as would be the possession of a railway, and this for exactly the same reason, which is that an aeroplane demands conditions, different but every bit as special, as those required for a railway. Aeroplane makers will hope in vain for the advent of the private buyer. One overlooks the fact that in all civilised countries the only land accessible to the public for circulation are the streets and the roads, all the rest being private property, and therefore unavailable, and, on the other hand, an aeroplane which will, like a car, drop us at our door, and be easily stored at home, is an obvious impossibility.

Things are very different if we imagine a regular aerial service performed by large aeroplanes carrying 25, 50, and 100 passengers or more. It can then be shown that such an aerial means of transit has over railways, for non-stop communication over long distances, substantial advantages of speed, comfort, economy, and even safety. London-Paris, London-Riviera, London-Berlin. In a very few years we should have London-New York, London-Cairo, India and the Cape.

But how are we to turn the dream into reality?

The very first condition is, of course, the sinews of war. None but a powerful company, somewhat of the order of a railway company, could launch on the venture. It must be strong enough to withstand the failures and the inevitable losses of the beginning, without incurring the risk of becoming bankrupt, like most pioneers of new ideas, on the very eve of the harvest.

I should like to see a huge International Syndicate in which would enter all the makers of the countries concerned, and possibly subsidised for a few years by the respective States.

There are two things which in this scheme would correspond to the building of the actual metalled line in a railway:—

(1) At the termini there must be vast stations, well appointed for the comfort of the public, and in close proximity to or quite easy reach of the large terminal centres.

(2) All along the line, spaced from 10 to 15 miles, there must be a series of refuges. These may hardly ever be used, but they must be there for the safety of the passengers. As long as they are spacious, level and clear, they may be used for grazing or hay-making, and would, thus once established, pay for their own unkeep. The pilots, who naturally would be intimately acquainted with their own line, would follow the line of these refuges at a sufficient altitude to be able at any time to reach the nearest *en vol plané*.

It is obvious that the primary outlay and the upkeep of these permanent conditions, which are really all that is required, are almost a negligible quantity when compared with the construction of a railway line many hundreds of miles in length.

For the rolling stock, or rather the flying stock, I give below the complete calculations based on the data explained in the first part of this paper. The figures speak for themselves.

For the motive power, since the action of very large cylinders is too brutal for light aeroplane engines, so that high powers can only be attained by the multiplication of cylinders, it is not only feasible, but very much more advisable, to use as many comparatively small engines as required than one large one, as by coupling all these engines star fashion round the central propeller shaft, they can easily be so disposed by

a lockable free-wheel gear on the centre shaft as to enable the operator to stop any one and restart it during flight.

The propellers are calculated from the formula H.P. = $D^3 n^2 p$ 006; in which D is diameter, p = pitch, n = revs. per second, and 0.006 an average co-efficient based on a large number of observations. If not absolutely correct, it is very near the mark, and certainly near enough for our purpose.

The cost of the fuel works out at about ¼d. per mile per passenger in the 25-passenger machine, and less as more passengers are carried at a time. The heaviest item in the working expenses would probably arise from the short life of petrol engines. This item is exceedingly difficult to estimate. But considering the small amount of wear there is otherwise, and the comparatively very small primary outlay, it would seem that the competition with railway prices would be easy.

I have to say yet another word about the body or fuselage of these passenger-carrying machines. I give them in all cases at their largest section a height and width equal to one-seventh the span, which is the proportion adopted by nature, where, however, it is round instead of square. Although one might think that a large body must increase head resistance, this is not so, and the reverse is true. It is another of those baffling anomalies which defy theory.

The following experiment was suggested to me by Mr. Handasyde when trying to account for the abnormal speed of the Nieuport. I made one pair of wings having two interchangeable bodies of identical weight and balance and of similar stream lines. The section 1, including the larger wheels, gives 12 to 15 per cent. more speed than section 2, also a better gliding angle and a much improved stability, so that the huge body of the Nieuport certainly accounts for a good deal of its great speed and efficiency.

The total weights are calculated on the assumption that a machine can be made to carry half its total weight in useful load. This has often been accomplished. The large Blériot which lifted eight men weighed 1,096 kilogs., out of which 550 kilogs. were human load, and is an example. It had, by the way, 40 square metres of surface, which by the formula $8 \times S^{1.33}$ corresponds to 1,078 kilogs. It was fitted with a 70-h.p. Gnôme, viz., less than 2 h.p. per square metre.

12-Passenger Machine.

12 passengers, 1 pilot, and 1 mechanic, at 75 kilogs.	1,050	kilogs.
Fuel for about 6 hours	300	,,
	1,350	
Machine complete	1,350	,,
	2,700	

Surface = $\left(\frac{2700}{8}\right)^{\frac{3}{4}}$ = 78 square metres, or span 23m × chord 3m 50.
Body space to accommodate passengers, 3m × 3m × 4.50m.
Power: 78m. at 2 h.p. per square metre = 156 h.p., say four 50-h.p. engines, or 200 h.p.
Propeller: Diameter, 5m 50.
Pitch, 4m 60 (allowing 25 per cent. slip).
Revolutions, 400 per min. (engine 1,200).
Gear, 3 to 1.
Pitch ratio, 0.82.
Tip angle, 15 degrees.
Tip speed, 112 m.p.sec.
Flying speed = 24 m.p.sec. (55 miles per hour).

25-Passenger Machine.

25 passengers at 75 kilogs.	1,875	kilogs.
Fuel for about 6 hours	425	,,
	2,300	,,
Machine complete	2,300	,,
	4,600	,,

From formula $P = 8S^{\frac{4}{3}}$ we have $S = \left(\frac{4600}{8}\right)^{\frac{3}{4}}$ = 118 square metres surface or span 28m × chord 4m 30.
Body space (4m × 4m × 6m).
Power, at 2 h.p. per square metre = 236 h.p., say four 78-80 h.p. engines, or 300 h.p.
Propeller: Diameter, 6m 50.
Pitch, 5m (allowing 25 per cent. slip).
Revolutions, 360 per min.
Gear, 20 to 6 (assuming engine 1,200 revs.).
Pitch ratio, 0.78.
Tip angle, 14 degrees.
Tip speed, 120 m.p.sec.
Flying speed: 24 m.p.sec. (about 55 miles per hour).

50-Passenger Machine.

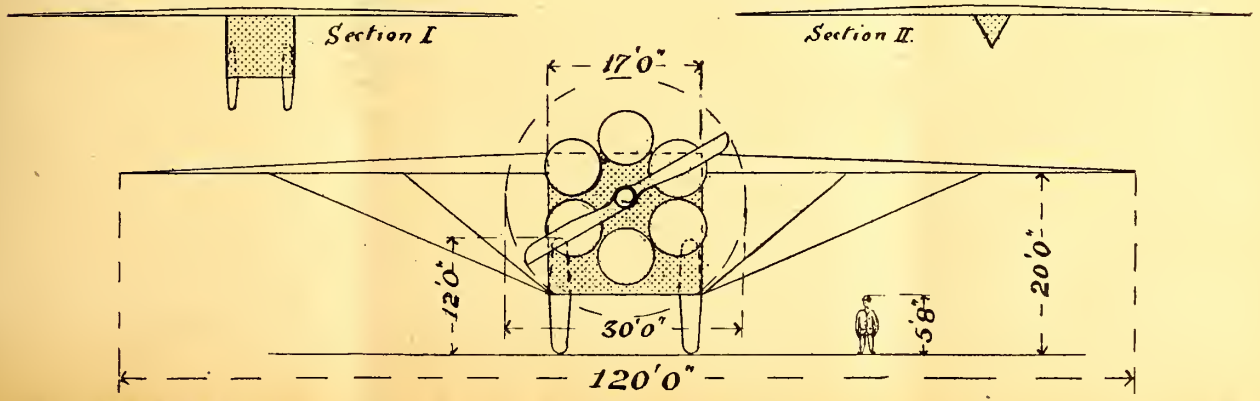
50 passengers at 75 kilogs.	3,750	kilogs.
Fuel for about 6 hours	750	,,
	4,500	,,
Machine complete	4,500	,,
	9,000	,,

Surface = $\left(\frac{9000}{8}\right)^{\frac{3}{4}}$ = 194m², or span 37m × chord 5m 20.
Body space (5m × 5m × 7.50m).
Power, at 2 h.p. per square metre = 388, say six 100-h.p. engines, or 600 h.p.
Propeller: Diameter, 9m.
Pitch, 6m 60 (allowing 25 per cent. slip).
Revolutions, 270 per minute.
Gear, 20 to 4.5 (engine 1,200).
Pitch ratio, 0.71.
Tip angle, 13 degrees.
Tip speed, 140 m.p.sec.
Flying speed, 24 metres per sec. (about 55 miles per hour).

100-Passenger Machine.

100 passengers at 75 kilogs.	7,500	kilogs.
Fuel for about 6 hours	1,500	,,
	9,000	,,
Machine complete	9,000	,,
	18,000	,,

Surface = $\left(\frac{18000}{8}\right)^{\frac{3}{4}}$ = 326 square metres, or 48 metres span × 6.80m chord.
Body space (6m × 6m × 9m).
Engine power, at 2 h.p. per square metre = 652 h.p., say six 140-150 h.p. engines = 900 h.p.
Propeller: Diameter, 12 m.
Pitch, 10 m (allowing 25 per cent. for slip).
Revolutions, 180 per min. (engine 1,200).
Gear, 20 to 3.
Pitch ratio, 0.83.
Tip angle, 15 degrees.
Tip speed, 112 m.p.sec.
Flying speed, 24 metres per sec. (55 miles per hour).



50-PASSENGER MACHINE.—Total weight, 9 tons; Span, 120 ft.; H.P., 600 h.p. (say 6 100-h.p. engines); Propeller, 30 ft.; Speed, 55 miles; Body space, 17 ft. by 17 ft. by 25 ft.

Military Aeroplanes.

In a strong article in *Vanity Fair* of February 7th Mr. Geoffrey de Holden-Stone sets forth the scheme by which that paper hopes to raise sufficient money in each county in England to buy an aeroplane or aeroplanes to be presented by each county to the Army. *Vanity Fair* asks for the support of the provincial papers throughout the country, and it is to be hoped that their aid will be cordially given.

"Recognising, too, the past magnificent efforts of our colleagues throughout the Press, we are confident of their wholehearted support. That will make, if not half our organisation, at least most of our success; so the credit of that success will be theirs more than our own.

"Meanwhile, here is the scheme. Here and now we specially invite the co-operation of the leading journals in every district of every county in the United Kingdom to raise *a subscription fund for the purchase of one to six aeroplanes each, of approved type for military purposes, for subsequent presentation to the War Office for the use of the Army and Territorial forces;* the conditions being:—

"(1) All machines to be chosen first, and their design approved, by a Selection Committee, consisting of (*a*) the Royal Aero Club, and (*b*) such other technical advisers as it may be considered advisable to call to their assistance.

"(2) All such machines to comply prospectively, as far as possible, with the requirements already announced for the forthcoming Military Aeroplane Trials.

"(3) (*a*) No restriction as to country of origin of the designs chosen; but (*b*) all machines to be built throughout in the United Kingdom, of British material, by British labour.

"(4) No restrictions whatever as to motors and propellers; but

"(5) Preference, so far as judiciously possible, to be given to all-British aeroplanes, motors, and propellers; that is to say, of British design as well as manufacture; actual or subsequent to selection according to (3*a*) above.

"(6) Each machine to bear the name of the purchasing county, or such name or names as may be selected by the subscribers therein.

"(7) All machines selected and purchased to be of constructional specification approved by the Selection Committee; preference to be given to all-metal construction as far as possible.

"(8) A reasonable margin for upkeep and repairs of each machine to be allowed for in each total county subscription; and sufficient allowance made for this purpose in respect of No. 1 before No. 2 is ordered, in order that the funds allotted by the War Office for the expenses of the Air Battalion or Territorials may not be embarrassed, and the use of the machines thereby restricted.

"(9) No manufacturer of aeroplanes or parts thereof to be eligible to serve on the Committee of Selection; but the Committee may call any such, as expert adviser, on any point not affecting his potential order.

"(10) The machines purchased to be placed at the absolute disposal of his Majesty's Military Forces, no matter where located, or where the War Office may choose to group or dispose them. We, however, suggest that, where possible, one or two machines at least may be stationed in the subscribing county in the neighbourhood of its regimental or Territorial depot, if that neighbourhood be suitable for flight practice.

"There is our proposition; in which, with the consent of our expert allies, we shall be only too delighted to incorporate any further practical improvement that expert advice may suggest. That is all we have to say about it, except that we propose to distribute some slight souvenir in the shape of photographs and illustrated descriptions of the machines purchased to subscribers. By these means, as well as by making the individual subscription of the smallest, we hope to give patriotism its reward in a widespread sense of individual proprietorship, and to make it a local as well as a national sentiment.

"Such, we feel sure, was the feeling of our great colleague M. Henri Desgrange, managing director of *L'Auto*, and his *confrères*. At any rate, here in the French colony in London a military aeroplane has already been subscribed for.

"Surely we do not intend to be outdone by our French guests in our own capital city.

"*Something of our own, great or small, given by each of us for our country's sake!*

"*L'État, c'est nous-mêmes!*"

Readers of The Aeroplane all over England should do their best to help the scheme, and can do so by getting in personal touch with the collecting centre in their own district and working with the local collectors.

French Army Aviation.

The weak organisation and the neglected state of the aviation section of the French Army is drawing forth serious criticisms in the better-informed of French journals and even in the Chamber of Deputies. It is absurd to ask for further large aviation grants while no promise of improvement in the condition of the different aviation camps is shown.

The excellent editor of *Le Matin*, M. Stephane Lauzanne, in an article of general criticism on the French War Office, gives one or two examples of the inefficient condition of the "fourth arm." Each aviation centre is under the command of a *chef de centre* of the rank of captain. It seems that these officers, while they have control of the actual flying, have no power to make any repairs or change a propeller, or make any similar alterations. They have to make application to a *chef de dépot*, who may have no knowledge of aviation at all, though he has power to refuse to fulfil any requisition of the *chef de centre*.

It is also said that the officers commanding centres are not informed as to their duties in case of war. They do not know where they are to be stationed nor under whom they are to serve. The army corps to which they are finally attached may be commanded by a general who knows nothing of aeroplanes and is far from any knowledge of the manner in which they are to be employed. In fact, the entire system is chaotic.

The French Army is popularly supposed to possess 234 effective aeroplanes. In point of fact, only a small percentage of these machines is available for flying, and consequently a less percentage are fit for war service. For instance, Captain Etévé, who commands the aviation centre of the Versailles district, has in his charge eleven aeroplanes numbered CMF 4, 5, 7, 8, 11, 12, 14, CHF 10, 12, 20, and CG. Actually of this number only two are in flying condition, CMF5 of Lieut. Lucca and CMF14 of Lieut. Battini. The other nine machines are entirely useless owing to perished canvas and warped wood, due to the rain pouring on them through the leaky roofs of the hangars.

Lieut. Battini, who is second in command of the Saint Cyr Military Aerodrome, tiring of training pupils in the old circus fashion of circling round a restricted space of flat ground, has developed a new method of teaching. He flies, accompanied by a pupil, from Saint Cyr to Buc and back by way of Bois d'Arcy, landing at each place. The distance from one point to the other is about six miles. He continues these journeys until the pupil is thoroughly acquainted with the methods of handling the machine, in particular in landing and rising. He has found that by this means their progress towards efficiency as pilots is much accelerated. In any case, this method inculcates at the most receptive period a useful knowledge of the rules of cross-country flying.

Enthusiasm ignores difficulties, and while it endures performs wonders. All that has been done so far in France is due to enthusiasm. But this force is habitually confined to one or two sides of a subject and not to all. At present the keenness in France is to learn to fly. What one is to do after that matters not. One is an aviator, and it suffices. Consequently there are those in France who, ignoring the very necessary reforms required in the Army Air Corps, desire that an aviation reserve shall be created. Principal among these is Doctor Reymond, who, though a senator and of great respectability, is an aviator of experience. He suggests that those aviators who have been compelled to relinquish flying owing to lack of means shall be permitted to serve a special term in the Army, during which they shall extend their aviation experience and secure their superior brevêt (military). At the conclusion of this special service they could be drafted into a reserve of aviators. Dr. Reymond also suggests that young men should have the opportunity of passing through an aviation course before they do their military service. If suitable and sufficiently promising he suggests they should be attached to the air corps during their military service. Afterwards they also would be drafted into the aviation reserve. It must be admitted that his scheme has distinct possibilities of success, and that some such reserve will probably be formed in the future.—W. E. de B. W.

The Week's Work.

Sunday, February 4th.

Brooklands.—Mr. Graham Gilmour, in spite of snow and wind, brought out Martin-Handasyde and did several alarming circuits, coming down with condensers frozen and machine covered with ice. Naturally no one else out anywhere.

The Plain.—At Bristol School M. Jullerot up early for trial, but conditions too bad for school work. Later Capt. Gilbert, of Italian Army, made two solos on No. 43, banking and landing *en vol plané*. Lieut. Ashton also out for two solos, and showed marked progress. Lieut. Bower, who has his certificate and now under instruction on monoplane, next on No. 66, for circuit, landing neatly. Mr. Hotchkiss doing great things with Lieut. Roger Harrison as passenger, making clever right and left-hand turns, at times letting passenger take control. Lieut. Bear then out for certificate, but darkness prevented completion.

Monday, February 5th.

Brooklands.—Mr. Johnston on *Vickers II* for one circuit early in morning. No one else out.

The Plain (Air Battalion).—Nothing doing till late in evening, when Capt. Fulton, Lieuts. Conner and Reynolds put in one or two flights each on biplanes.

Tuesday, February 6th.

Brooklands.—Busy day. At Avro School, Messrs. Sippe, Young and Setti all out on Avro Green.

At Deperdussin School, Mr. Petre, new chief of school, out for first trials on brevêt machine, and made circuit in very nasty wind. Signor Sabelli upon same machine. Mr. Gill rolling on taxi, and Mr. Petre again out on brevêt machine.

At Vickers School Mr. Johnston doing circuits for 10 minutes on *Vickers II*. Then Mr. MacDonald, lately flying so well on biplane in Australia and now joined Vickers, Ltd., went for first monoplane flight, took machine straight off ground and did three circuits, but forgot to keep up pressure in petrol tank, so engine stopped over paddock, result being forced glide, and, machine being strange to him, made rough landing and bent skid strut. Otherwise capital effort for first attempt.

At Bristol School Mr. Pizey up with Lieut. Carfrae, and same pupil up with Mr. Fleming. Capt. Weeding doing solo had bad time with remous over thawing snow. In afternoon Capt. Weeding made attempt for certificate, doing excellent 8's, but stopped by wind from doing height test. Mr. Fleming took up Mr. Lane, and Mr. Nesham did two solo circuits. Meantime Bristol-Anzani monoplane made first appearance. Very smart little machine, and flying easily despite low power. Mr. Pizey took her up to 300 ft. for two circuits, and when wishing to land found switch out of order, so had to come down on throttle alone, which he did very smartly. Switch put right and then did two more circuits. Machine much admired, and decided addition to Bristol School. Later Mr. Pizey up on biplane with Mr. Lane.

Barrhead.—Snowed steadily all morning, but in afternoon Mrs. Lucking and H. O. Walsh had school machine out and did rolling practice until dark.

Eastchurch.—Engineer Lieut. Randell, R.N., went for certificate in fine style, despite wind of some 20 m.p.h., as shown by Dines, which must have been considerably faster up aloft. Mr. Randell is pupil of Capt. Gerrard, R.M.L.I., who is without rival in "high art" flying, and consequently has had good drilling.

Mr. Travers also out in morning with Territorial pupils, Messrs. Hedley and Meredith. Former made good straights and shows splendid progress. Mr. Meredith not yet flown by himself, owing to weather, but he is able to take over control when in air with Mr. Travers on Short dual control machine.

Hendon.—At Grahame-White School, owing to weather, no flying, but Mr. Lewis Turner giving theoretical instruction in workshops.

The Plain.—Very little improvement in weather; only two passenger flights, M. Jullerot being pilot.

Wednesday, February 7th.

Brooklands.—At Deperdussin School Mr. Gill rolling for quarter hour on taxi, and Mr. "Partridge" doing straights.

At Sopwith School Mr. Sopwith busy tuning up American Wright and later took Mr. Pizey as passenger. First appearance of Wright machine at Brooklands in full flying order. Apparent facility of handling quite astonishing to those used only to ordinary type biplanes.

SCENES AT EASTCHURCH.

Mr. Jezzi's biplane. Mr. Travers and a Territorial Aviator on a Short biplane. Mr. Ogilvie landing on his N.E.C.-Wright. Mr. Valentine's Deperdussin.

At Flanders School Mr. Ronald Kemp out tuning engine.

At Bristol School Mr. Fleming made his first flight on monoplane. Rudder-bar and control lever built to fit small size in pilots, consequently those of elongated design, such as Mr. Fleming, find control with knees under chin somewhat peculiar. Nevertheless, Mr. Fleming's get-off and landings quite good. Later Mr. Pizey, on same machine, gave pretty display, machine fitting him nicely. School work as usual. Lieut. Carfrae for first solo making very good landings.

Barrhead.—Number of interested friends at aerodrome when Philpott out on school machine and did some fine flying considering engine was not pulling well.

Eastchurch.—Territorials put in few hours' practice during day, being out at 7 a.m.

Hendon.—At Blériot School first fine day of week, taking advantage of half hour comparatively calm M. Pothet did couple of straights very well, and will be doing circuits by next week. Mr. Morris two straights in good style, and Mr. Hall also out rolling.

At Grahame-White School Mr. Lewis Turner out on biplane No. 2 in morning for several circuits, but fog very unpleasant, and pupils retired to workshops.

Thursday, February 8th.

Brooklands.—Rain and wind. Nothing doing.

Hendon.—At Grahame-White School weather conditions appalling; no outdoor work.

The Plain.—Towards evening M. Jullerot made ascent, but found eddies much too strong.

Friday, February 9th.

Brooklands.—Very bad day, but at Sopwith School tuning of American Wright continued, Mr. Sopwith taking up as passengers Mr. Fisher and Mr. "Partridge" in turn, machine doing well and manœuvring capitally.

At Percival School Mr. Percival out tuning engine.

Barrhead.—Grand day and lot of rolling practice done by the pupils, Mrs. Lucking and Messrs. Walsh and Clinkskill.

Hendon.—At Grahame-White School weather still unsatisfactory; theory only.

The Plain.—Mr. Hotchkiss out early testing, but after two circuits decided to abandon school flying.

The Plain (Air Battalion).—In morning Capt. Fulton and Lieut. Barrington-Kennett out on biplane, but found conditions too trying to remain out longer than about 15 minutes each. Lieut. Hynes out on Breguet with three passengers, amongst whom was M. Jullerot, of Bristol School, who enjoyed his taxi ride immensely, especially *finale*.

Saturday, February 10th.

Brooklands.—Very busy day, despite nasty choppy wind. At Avro School Messrs. Sippe, Young and Setti out on Avro-Green, Mr. Young making particularly neat landings. Mr. Duigan, the Australian aviator, expected this week from Huntingdon with new type Avro-E.N.V.

At Deperdussin School, Mr. Gill rolling on taxi, and Mr. "Partridge" making first attempt on racer, chasing own tail in approved fashion, but soon getting control and going good straight flights. 40-h.p. A.B.C. engine now being fitted to Deperdussin taxi *No. 4*. Some exciting flying may be expected when ready.

At Percival School Mr. Percival out tuning in morning cracked cylinder so retired for day.

At Herbert Spencer School Mr. Spencer up with Mr. Marcus and another as passengers, in turn, big biplane flying excellently.

At Vickers School Capt. Wood doing excellent circuits on *Vickers II*, machine apparently lifting easily and getting better power with British engine than with French. Later testing *Vickers III*, now with fuselage slightly altered, and promising to fly well when tuned.

At Sopwith School Mr. Sopwith doing astounding tricks on American Wright, making quick steeply banked turns close to ground, diving, switch-backing, and generally comporting himself like Brooklands plovers. Also took up Messrs. Manning, Hamel and Raynham as passengers. Other machines of school rapidly approaching readiness for use. Mr. Sigrist's fitting of dual control to Wright very neatly done, and should be much appreciated by those wishing to learn to fly while in air, instead of wasting time rolling.

At Bristol School Messrs. Pizey and Fleming up with pupils. Lieut. Carfrae, doing solo, lost his cap, grabbed for it to prevent it blowing back into propeller; in doing so pushed lever forward and brought machine down on nose heavily, landing on points of skids, smashing most of machine, but happily escaping unhurt himself. In afternoon Capt. Allen, who took certificate some time ago, intending to learn monoplane, did "refresher course" (at own, not official expense) on biplane before starting faster machine, and showed no sign of being out of practice. Later Miss Allen up as passenger with Mr. Pizey. Captain Weeding went for tour over Chertsey way, apparently investigating tree-tops at close quarters. Capt. Raleigh flying circuits in nice style. Mr. Pizey did pretty performance on monoplane, but wind evidently gusty for low-powered machine.

Mr. F. W. Merriam, the Cornish Aviator, who recently took his certificate in excellent style at the Bristol Brooklands School.

Barrhead.—Mrs. Lucking out and did exceedingly well. This lady should be able to get her brevêt within week or so, given fine weather.

Eastchurch.—Fairly stiff breeze but most of Eastchurch machines out; Mr. Alec. Ogilvie flying N.E.C.-Wright, which for some time past has been fitted with neat stream-line "*nacelle.*" During afternoon number of distinguished people visited the aerodrome, party including Vice-Admiral Hamilton, C.-in-C. 3rd and 4th Divisions Home Fleet; Rear-Admiral Dundas; Commander Erskine, of R.N. Barracks, Chatham; Flag-Commander Best and Captain Wilkins, of H.M.S. *Antrim*. Visitors treated to good exhibition, seven machines being out together. Commander Samson, R.N., flying Short tandem-twin, which, now fitted with extensions, dwarfs all other machines at Eastchurch, with its 64 ft. span. Lieut. Longmore, R.N., out on Short tractor biplane, on which he took up Flag-Commander Best for his first experience of flying. Lieut. Longmore, full of praise for tractor machine, declaring her to be most stable machine he has yet flown, and he has had experience of most types, including some of best foreign makes. Captain Gerrard, R.M.L.I., took up Vice-Admiral Hamilton's son, and Lieut. Gregory, R.N., also out. Mr. Frank McClean, returned from Switzerland, flying in usual skilful manner on triple-twin.

Hendon.—At Ewen School, owing to weather, little flying until to-day. Time profitably spent in hangar, where the 28 Deperdussin has had a thorough overhaul. Now pulling better than ever. Ewen out on Blériot, and after short trial gave machine over to pupils. Three good hours' practice put in, during which Messrs. Lawford, Baumann and Dubois made excellent progress. Capt. Loraine, who has now mastered Blériot and Deperdussin, made several flights, possibly last at Hendon before taking up duty at Salisbury.

At Blériot School all pupils put in good spell of work. Mr. Parr took brevêt machine out, and did three 8's at about

200 ft, landing *en vol plané* in good style. Mr. Allen then up for brace of 8's at about 150 ft., coming down with masterly spiral *vol plané*, as though he had made a particular study of this particular mode. Mr. Prenssiel then did three circuits, landing *en vol plané* in perfect style. M. Salmet, school instructor, brought out 50-h.p. Blériot to try new and peculiarly shaped propeller, which appeared very efficient, engine pulling him round several 8's at low altitude and in small space, showing pupils ease and safety of banking at turns.

At Grahame-White School good deal of work. Mr. Turner out doing solo on biplane No. 2, prior to taking up Mr. Ramsay, new pupil, as passenger for several circuits, and afterwards giving instruction to Mr. Raphaite in same way. Mr. Gates also out on same machine, putting in good work at straight flights. Biplane No. 3 also out in hands of Mr. Biard, who first made straights and afterwards four circuits, flying well and making splendid landings, Mr. Raphaite putting in good practice rolling.

The Plain.—M. Jullerot and Mr. Hotchkiss out making trials. Lieut. Head prominent with flight of 20 mins., with fine right and left-hand turns. Lieut. Bower out for solo on No. 66, and then on two-seater monoplane for circuits. Lieut. Harrison and Mr. Bendall each solos, and Mr. Hotchkiss up for exhibition flight, as also Lieut. Cochrane, R.N. During the week several new pupils have joined Bristol School, amongst them being Commander Schwann, R.N., of hydroplane fame, Lieut.-Col. C. O. Smeaton, who already has his certificate, and is presumably going to take up the monoplane.

Sunday, February 11th.

Brooklands.—Calm morning, but very windy midday. At Vickers School Capt. Wood out early testing *Vickers III*, getting off very quickly and apparently handling well. Capt. Sykes flying *Vickers II*, and Messrs. Johnston and MacDonald later on same machine.

At Bristol School Capts. Weeding, Raleigh and Allen, Lieuts. Longcroft, Smith and Wyness-Stuart, and Messrs. Merrian, Nesham and Lane all up in turn on the uninjured biplane, despite gusty wind, in evening. Messrs. Pizey and Fleming also out with passengers. Altogether 25 or 30 flights on the same machine during the day.

At Herbert Spencer School Mr. Spencer out in afternoon with numerous passengers, flying excellently.

At Deperdussin School Mr. Gill out early on taxi. New British-built two-seater expected during week. This will be considerable attraction at school.

At Sopwith School Mr. Sopwith performing prettily on American Wright in spite of gusty wind of early afternoon. Later took up several passengers, including Mr. Robert Loraine, who was quite charmed with manœuvring of machine.

Brooklands looking quite itself again. Numerous cars in enclosure, and well known visitors of last summer beginning to reappear.

Eastchurch.—Mr. Frank McClean upon tandem twin, with Mr. Fowler as passenger, showing great steadiness in gusty wind. Machine, now fitted with enormous petrol tanks, showed herself very fast even against wind. At same time Mr. Jezzi flying on his speedy little biplane, which climbed remarkably fast whenever required.

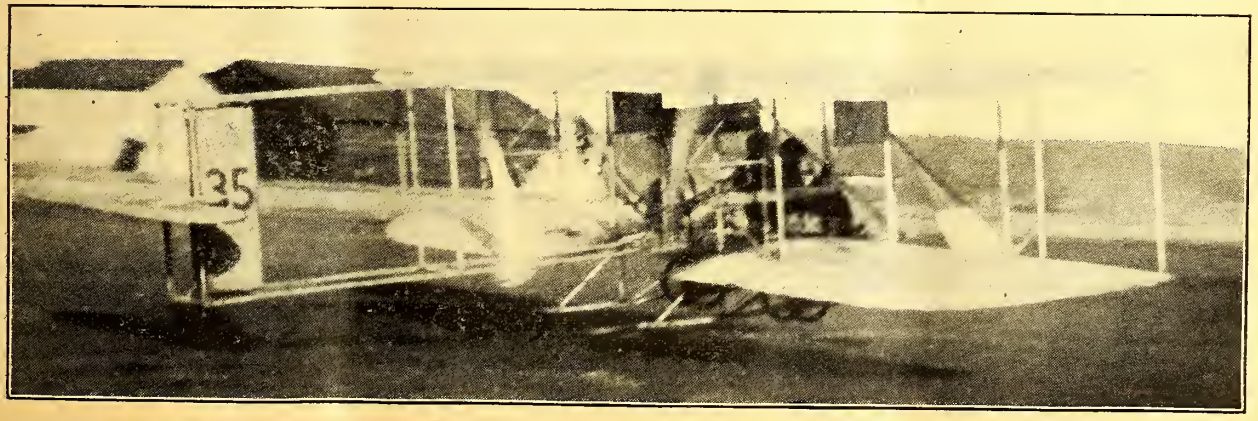
Hendon.—Pupils of the W. H. Ewen School at the Aerodrome in force, but during the whole day the wind continued too gusty to allow the school machines to be brought out.

One of Mr. Sopwith's astonishing banked dives on Saturday last.

Flying in Wales.

Mr. Vivian Hewitt, who for some time had a Blériot at Brooklands, has recently been doing some very good flying round and about Rhyl. He has put up a shed at Foryd, and is establishing an aerodrome there on his own account. In the summer, when the district is full of visitors, Mr. Hewitt's venture ought to be very successful, especially if he starts a passenger-carrying machine and takes passengers at reasonable fares.

On January 25th Mr. Hewitt commenced his regular flying of this year by making a trip round Rhyl and dropping at various parts of the town envelopes containing a signed photograph, endorsed "Dropped by Vivian Hewitt from his monoplane at Rhyl on Thursday, January 25th, 1912." A local paper, reporting his flight, said that "while crossing the



Mr. Sopwith and Mr. Manning just getting off on the Sopwith School American Wright.

promenade Mr. Hewitt rather startled the onlookers by firing three shots from his revolver." A rival paper shortly afterwards said, "I will be remembered in our report of Mr. Vivian Hewitt's flight last week we did *not* refer to any revolver shots which were mentioned elsewhere as having been fired by Mr. Hewitt. As this might prove alarming to some nervous people, it might be advisable to explain that Mr. Hewitt does not carry any revolver with him when soaring aloft. These reports are merely what are technically known as misfires of the engine. It should be noted that there is no danger to anyone, and there are no bullets to drop." The same afternoon Mr. Hewitt raced the London express from Rhyl to Bagillt, and beat it. He then turned inland as far as Trefnant, and then returned to Foryd, being in the air for 65 minutes. On the following Monday Mr. Hewitt was up again as far as St. Thomas' and back. After some of the so-called aviation exhibitions in North Wales last year, it must be rather pleasing to the inhabitants to have a real flying machine in their midst.

Lieut. Manisty's Accident.

On Saturday, February 3rd, Lieut. G. J. E. Manisty, 67th Punjabis, Indian Army, who is attached to the Air Battalion, was thrown from his motor bicycle owing to a skid at night on the frost-bound road, and was very seriously injured. He suffered from severe concussion, amongst other injuries, and was unconscious for three days. According to the latest reports he is progressing favourably. One hopes he will recover rapidly from this regrettable accident, and will soon rejoin the Aeroplane Company on the Plain.

A New Move in the Air Battalion.

At least one of the reproaches against the present organisation of the Air Battalion is about to be removed. The Aeroplane has on occasion been under the unpleasant necessity of pointing out in the interests of the efficiency of the Service that neither the officer commanding the Air Battalion, nor the Adjutant and Instructor, had any practical experience of aeroplane work beyond an occasional passenger trip on one or other of the box-kites at Farnborough. It is now reported that Major Sir Arthur Bannerman, R.E., Commandant of the Air Battalion, has joined the Bristol School at Brooklands, and Captain Broke-Smith, R.E., the Adjutant, is under orders to proceed to Salisbury Plain to learn to fly on the Army machines there. It is to be hoped that having themselves learned to fly, these officers will come to a knowledge of the fact that Army aviators of a better quality are obtained by accepting volunteers of no matter what branch of the Service than by pressing circulars sent to one branch only.

The Royal Aero Club.

The Annual General Meeting will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

The Percival School Biplane going well.

Captain Gilbert of the Italian Army, recentlv flying a Bristol over Salisbury Plain.

Thursday, February 29th, 1912, is the last day for the receipt of notices of motion. The retiring members of the Committee are: Ernest C. Bucknall; Col. J. E. Capper, C.B., R.E.; G. B. Cockburn; E. Manville; J. T. C. Moore-Brabazon; Sir Charles D. Rose, Bart., M.P.; A. Mortimer Singer; Hon. A. Stanley, M.P.; R. W. Wallace, K.C. Thursday, March 7th, is the last day for the receipt of nominations.

At the meeting of the Committee on Tuesday, the 6th inst., the following new members were elected: Damer Leslie Allen, Henry Bedford Hemmons, Cyril Wright Meredith, Lionel Seymour Metford, Harold Gustav Meyer, M.A., LL.B., and Gerald Meyrick Part.

The following Aviators' Certificates were granted: 179, Frederick Warren Merriam (Bristol biplane, Brooklands); 180, William Bendall (Bristol biplane, Salisbury).

Army and Navy Aviation Prizes (presented by Mr. A. Mortimer Singer):—Intending competitors are again reminded that this competition will close on March 31st, 1912. Entries have so far been received from the following: Capt. C. R. W. Allen (Infantry); Capt. G. W. Dawes (Infantry); Capt. J. D. B. Fulton, R.F.A.; Capt. E. L. Gerrard, R.M.L.I.; Lieut. R. Gregory, R.N.; Lieut. G. B. Hynes, R.G.A.; Lieut. A. M. Longmore, R.N.; Capt. E. B. Loraine (Grenadier Guards); Lieut. W. Parke, R.N.; Commander C. R. Samson, R.N.

An International Aero Exhibition, organised by the k.k. Oesterreichischen Flugtechnischen Verein, will take place in Vienna from May 18th to June 23rd, 1912. Full particulars, together with application forms for space, can be obtained from Harold E. Perrin, Sec., Royal Aero Club, 166, Piccadilly, W.

Russian Army Aviation.

The Russian Government has ordered an Etrich monoplane (120-h.p. Austrian-Daimler engine) for service in the Russian Army. Numerous machines of this type have also been purchased by the German and Italian Governments.

It is reported from Sevastopol, in the Crimea, that two military pupils, Captains Ivanich and Leon, had a fall whilst flying a Farman biplane at a local aviation school on February 7th. The petrol tank burst, and the petrol caught fire, burning the two pupils to death. If true this is another pressing argument in favour of the use of heavy oil.

CONTINENTAL NOTES.

Mr. Gordon Bell continues to make excellent flights at Buc on the R. E. P. monoplane. On February 10th he tested the new type monoplane fitted with the new seven-cylinder motor. Rising rapidly to a height of 500 metres, he remained in the air for half an hour, making beautiful evolutions over the surrounding country. Later in the day he made three flights on the "type-Circuit" machine allotted to him. He concluded the last flight of the three with a magnificent *vol plané*, which has called forth praise from the French aeronautical Press.

Mr. Robinson, who recently brought two Curtiss hydro-acroplanes from America, has been making several successful flights with them at Juan-les-Pins, a coast town near Antibes, in the South of France. On February 6th he made a flight starting from the Casino terrace. Though a heavy sea was running he alighted on the surface of the water with perfect safety. He rose and again alighted several times, finally returning to his starting place. M. Paulhan, who has purchased one of these machines, is with Mr. Robinson at Juan-les-Pins, and after some practice has the intention of giving exhibitions. It is amusing to note that while almost every British paper has paragraphed the performances of the American Robinson, none of them ever pay any attention to the British hydro-aviators, Messrs. Wakefield, Adams, and Gnosspelius.

On February 10th, Mr. Robinson made further successful flights over the bay at Juan-les-Pins. In the course of one of his flights he passed over the French cruiser *Justice*, on the deck of which he dropped a letter inviting Admiral Moreau to lunch. He also flew on Sunday, though the sea was very rough. At the end of his last flight he alighted in the bay and was at once overturned, fortunately close enough in for him to swim ashore.

Engine starting by propeller swinging has claimed another victim. At Johannisthal aerodrome on the afternoon of February 10th, a mechanic named Conrad slipped forwards whilst swinging the propeller of Herr Hoffman's aeroplane. The engine started at the same moment and the unfortunate mechanic was struck by the propeller. He now lies in hospital in a critical condition, unconscious, with a fractured skull, a broken arm and other minor injuries.

America has possessed for many years numerous daily journals which, from the jaundiced nature of their contents, have been named as a class the "Yellow Press." Civilised nations also are not without periodicals of this type. France even has several newspapers confining their attentions to the dissemination of scurrilities and picturesque untruths. The latest canard is based on the ever-present expectation of a German invasion. A Parisian illustrated newspaper of the cheaper sort has announced the discovery by its able reporters of a German plot. According to them the German Government has placed orders in France for three hundred aeroplanes, all of which are to be delivered in March. It appears that it is then the intention of the German Army to make an aerial raid on Paris.

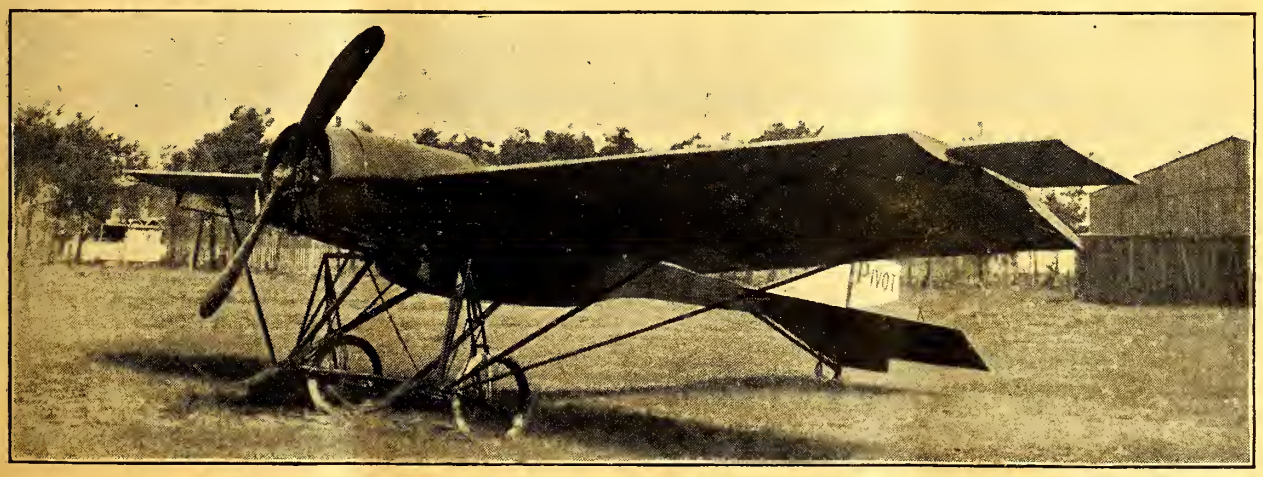
Starting from fortified towns on the German frontier, such as Strasburg and Metz, the gallant three hundred aerial soldiers, armed with bombs of the most ferocious type, will fly straight to Paris. Circling high above the city they will, by means of the bombs, scatter death in the streets and spread terror broadcast in the homes of the gay Parisians. Having increased the death-rate and upset the annual statistical reports, they will return swiftly to Germany. Seven hours in the air is all that is necessary for the execution of this deadly scheme.

There are things which are possible without being probable. One knows that Germany stops at nothing in the struggle to gain her own ends. Honour has no place in her code, and her imperial record is largely one of treacherous appropriation, but none can accuse her of lunacy. Why the German Government should purchase aeroplanes in France while it has its own constructors is not quite clear. Such an act would be divulging plans and progress in a manner not usual to Germany. Further, a raid of this type could only succeed if there were no opposition—an unlikely event. A similar attack on London is far more likely and much greater success would attend it.

The accompanying photograph is that of a Pivot monoplane, a machine which has had some success during the past year. The type was originated by M. Koechlin, whose business M. Pivot purchased about fourteen months ago. Since that time these machines have made many very successful appearances at various aviation meetings. During the military trials at Reims, Ehrmann flew from Mourmelon on a 70-h.p. Pivot in a wind of nearly sixty miles an hour. As flying was considered impossible on that day Ehrmann's appearance caused considerable sensation, the British aviators present being particularly impressed.

The principal feature of the machine is the total suppression of all wire, and with it its tendency to break through fatigue owing to vibration, and its considerable head resistance when vibrating. The bodywork is in torpedo form, the pilot and passenger being protected from oil and wind, and having reasonably comfortable seats. The chassis is of a new form, very elastic, with an orientable wheel-base, and it carries a long skid to prevent somersaulting. The wings are absolutely rigid, and are supported on, and by, steel tubes, the whole forming a solid block. Ailerons are used, and these are operated by a back-rest, as in the Curtiss, the wheel operating the rudder and elevator only, and this can be controlled with one hand. The machine is only 21 ft. long, and so can travel on an ordinary railway truck. The span is 10.5 metres, the surface is 16 square metres, and the weight 310 kilogrammes. M. Pivot claims that the speed of the new two-seater is 120 kilometres (or about 72 miles) per hour, with a 70-h.p. engine.

An enthusiastic meeting was held on February 11th at the Sorbonne by those interested in the furtherance of military aeronautics. A "National Committee of Military Aeronautics" was formed in order to organise private enterprise. A sum of £120 was collected at the conclusion of the speeches, and promises were made of £4,000 from the Brothers Michelin. Both M. Deutsch de la Meurthe and the Association Générale Aéronautique undertook to present aeroplanes. Several of those present made gifts of aerodromes, sheds and material.—Pingouin Rose.



The Pivot Monoplane, a "wireless" French machine described above.

Correspondence.

The Editor of The Aeroplane *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* The Aeroplane, 166, *Piccadilly, W.*

More Official Eccentricities.

Sir,—Under the Army Order 5, 1912, Terms and Conditions of Army Service, Royal Engineers, in paragraph 6 it is stated that, "Men of the following trades who are in possession of a certificate of trade proficiency and are otherwise qualified for enlistment, may be enlisted as Sappers if accepted by the Officer in Charge of R.E. Records," and gives a dozen among which occur, "Rigger (for training as an airman)"; "Sailmaker (for training as an airman)."

Can you tell me what special qualification Riggers and Sailmakers may have for "airmanship"?

The whole thing seems in keeping with the War Office attitude to aviation.

"Student of Army Orders."

A Request from Belgium.

Sir,—From February next I am editor of the *Mois Aeronautique Anglais,* that will appear as supplement of *Le Mois Aeronautique,* edited by Mr. Desmons in Paris.

I have the honour to ask to English builders of apparatus, models, motors, etc., to send me their catalogues, price lists, and any particulars they should believe to be of some interest to me.

I will give in my review an abstract of the English reviews devoted to aviation, aeronautics, or motor vehicles (included aeroplanes) which I will receive. I ask also for abstracts of patents and all which interests the English aviation business.

A. Bracke, Editor of *Aero-Mecanique,* Casteau, Mons.

One-Man Power.

Sir,—I was very interested in the letter from your correspondent, M. Clarence Rosini. Perhaps he would be kind enough to favour us with the report and a description of the 1-M.P. machine mentioned. After this, how could we doubt the American flying with some 4 h.p. only?

Another little point which M. Rosini could make us easy about is, how he attained the elevation. Did he fall, or was he pushed, or was he wearing Ergaer socks doped with self-raising flour, as he could not have had his boots on to have accomplished such a feat? I have performed similar, in fact, even greater, feats than this (after a heavy supper).

But surely this gentleman is jesting. Perhaps he would be good enough to name the spirit he used in this 1-M.P. machine. There have been cases known where too rich a mixture has produced the same serious effect in various forms, but, there, I am sure M. Rosini will forgive this thusness when he reads the little paragraph on the subject by Mr. P. K. Turner. In case it did not catch his eye, I will repeat it (with your kind permission, sir):—"Even if I had leisure to spend two or three weeks in designing a hypothetical machine, I should not waste that time on a type which has been proved to be *utterly impossible* in the present state of our knowledge of the subject."

Cheltenham. Harry Higgins.

Air Pockets.

Sir,—I have been asked by so many people what the so-called "air-holes" or "air-pockets" are and by what they are caused, that I think a general explanation of the phenomenon may be acceptable to many of your readers, inasmuch as I do not remember having seen a comprehensive explanation in any book.

In the first place, it must be clearly understood that there are no true "air-holes" or atmospheric vacua, except such as are created by the passage of lightning, the explosion of dynamite, or the discharge of a gun or rifle, etc.

In the case of an "air-pocket" in the aeronautic sense, the sudden fall of the aeroplane is caused, *not by a vacuum or reduction of atmospheric pressure,* but by the fact that the aeroplane suddenly plunges into a current of air which is moving *approximately in the same direction* and at the same speed, or even faster than the machine.

The aeroplane must, in such a case, drop suddenly, just as an ordinary motor-car would if it should go over a precipice. But with this difference. The motor-car would continue to fall with ever-increasing velocity, while the aeroplane, though it might fall with alarming rapidity for two or three seconds, would, under proper control, soon be checked by the increased resistance set up in its wing surfaces owing to the increase in velocity. The acceleration thus produced can, by controlling surfaces, be immediately utilised and transformed into horizontal flight, thus counteracting and nullifying the disaster which would otherwise result from a plunge into a following current of air. Such currents may be of wide extent, or merely the periphery of small "vortices" or whirlwinds, with a radius not much more than the span of an aeroplane or even less. They may be whirling round an axis, horizontal or vertical, or at any angle with the earth's surface.

Whatever the angle may be, if the aeroplane strikes that portion of the periphery which is moving in the same direction, the aviator may experience that unpleasant phenomenon, which, judging from its results, he describes as "a hole in the air."

Now wind does not blow everywhere from the same quarter at the same time, especially in England. It therefore follows that winds blowing from different quarters must pass each other, and whether they pass each other in a vertical, horizontal or any other plane, vortices will be created in their vicinity. Vortices are also created by hills, cliffs, trees, buildings, etc., with which the wind collides.

Lastly, "vortices" are set up by the propellers of aeroplanes, and such are of sufficient velocity and durability to imperil the stability of any other machine which crosses its path or follows too closely in its wake.

Such vortices are often likely to affect the wings unequally, and so suddenly as to defeat the most skilful of pilots.

Therefore the need of quickly acting automatic compensatory action is imperative.

This is a problem too complex for mathematical analysis, and can only be solved by practical experiment. A noble army of pioneers are daily risking life and limb in the struggle with the elements, and though many a hero may fall in the fight, victory will soon be theirs.

And then the scientists who have repeatedly proved that human flight is dynamically impossible will be able, from their easy chairs, to propound elaborate algebraical expressions to explain how it ought to be done, and to demonstrate our folly in launching ourselves into the air without first consulting them.

"Altair."

"Frictional Support."

Sir,—Further I interest myself in aviation the greater I am mistified, at anyrate, in the discoveries, also in the formation of new words. Owing to my having very little knowledge of European languages, I always try to shelter under Chambers' or Webster's Dictionaries, but the new discovery of Dr. Hankin's "Ergaer" has determined me to learn Esperanto. Dr. Hankin mentions chiils in regard to his discovery. Well, there are plenty of chiils and cawas in India, and their names brings the happy (?) recollections of the pass-time of my boyhood, which come pouring over me like a dream, the scrambling up cocoanut-trees, etc., to deprive (steal) these poor creatures of their eggs (for which we usually had to pay dearly).

The chiils generally build their nests on high places, such as cocoanut trees, etc., even sometimes inside of a church steeple. These birds have an instinct given them by which they can spot their enemies. Here comes the "diving and soaring flight." From a great height they would (we could sometimes see them) leap out and with outstretched wings come diving down (angle of which I cannot say) upon his victim, and woe be unto him if he had no headgear, as the beaks and the claws played their own parts. No sooner it had its revenge it would flap its wings two or three times and glide or soar away (if in a field and no obstacles), whether it be cloudy or sunshine. I have seen chiils soaring after sunset almost every day of my life (at home), not in the monsoons, of course.

Then, again, in agricultural districts (in Chawbis Pargana) when it is cloudy and the farmers see hundreds of chiils soaring, everyone prepares for a storm (as this is a sign for same). This also proves that soaring is possible without the aid of sunshine. It proves more so my theory re frictional support, about which your readers have noticed in my last letter. One can distinctly see these soaring creatures glide once down then up, occasionally moving their wings (when in an air-pocket or loosing speed), but when momentum is gained soaring starts, and the support from the "meaner power" (electricity from the air) keeping it up till such time the speed is slackened and more propulsion needed.

The aeroplane exactly follows suit, when it drops in an air-pocket the pilot gives more petrol to the engine (if there be

any reserve power) and tilts his elevator till it regains itself (to the meaner power or air current), and when speed is gained the electrical power developed by "friction" draws other meaner powers which are in the air, and the latter (power) striking the under part of the plane, "helps it to soar." The pilot here takes advantage and switches off the (artificial) reserve power for another time (as the difficiency is made up by nature).

Dr. Hankin's remark (I take it to be) re sunshine being the chief implement for soaring. I have never seen a chiil, or any other bird, soaring right off the level ground, in spite of the sun being scorching and the natives had to hold umbrellas over them; but on the contrary (another proof of my frictionable theory), always flap or propels at the time of leaving the ground, and often keep on (propelling) till such time speed is gained (here the nature starts its work and helps it) to start soaring.

I shall next take the cawa, or crow (there are several kinds of cawas, most of them are like a rook, but not quite as big nor as shiny black). The one I am alluding to has a short, or stumpy, tail (an sumin Dhapá). I have chased many of these cawas while out shooting (not cawas). It is strange to say they cannot soar any distance. Most I have seen soaring about twenty yards (not while being chased, of course), although the sun has been broiling. The reason why these cawas cannot soar much, I think, is owing to the gap in the feathers on the wings being parted like a fork; there being other reasons as well. As the cawa is not much of a soarer I shall leave them at this.

What I have mentioned here are discovered by me in the districts mentioned, and have done so simply to further (and not as a criterion) the cause of aviation, in which, like many of your readers, I started to take an interest since the world-recorded flight of M. Blériot, and have hardly missed an opportunity to gain knowledge from all sources. Moreover, when the well-known Colonel was in Liverpool (I mean Mr. Cody), whose misfortune has been my gain, as I received much information and knowledge from the "flying cathedral" which was a credit to the inventor, and would have flown well if he had a more powerful engine.

Conversations with aviators, also with people interested in the service at Blackpool, Aintree, Seaforth, Waterloo, and other places, along with some experiments which I have made, I come to this conclusion, that we must utilise "natural power" as much as possible, not by wings that flap, neither by overloading our aircrafts by unnecessary apparatus, as some have suggested, but by the aforesaid method, which can be done. In conclusion, I would like to say that the climatic (atmospheric for England please) differences helps to increase or decrease the "Frictional Support."

Birkenhead. C. M. Seale (of Bengal).

[In a covering letter, Mr. Seale says he is not a Hindoo or a Mahomedan, but a pure-blooded Bengali.—Ed.]

A Libel in Bronze.

Sir,—May I direct your attention to the libel on aviation now being erected at the entrance to Constitution Hill? The group in question represents the breakdown of the first flying machine, which is shown being ignominiously drawn along the streets, in a car, by three horses. The machine is one of the early ornithopters, and as both wings are uninjured the breakdown was probably due to engine trouble, these early one-woman engine being peculiarly liable to hysterical and other electrical complaints.

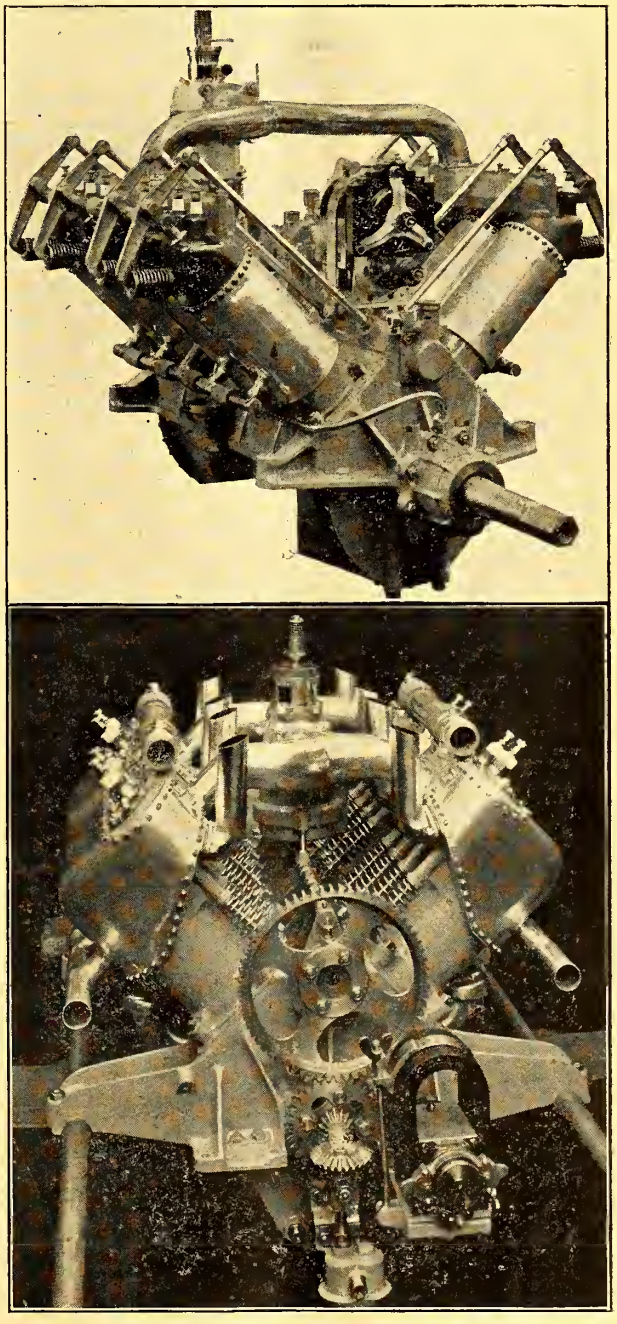
I have nothing to say with regard to the points of the machine itself as represented, which are sufficiently orthodox, though it does seem to me that the wings are insufficiently cambered and the aspect ratio too high and the centre of gravity too far back from the centre of pressure for a really efficient machine such as this type has always been supposed to be. But, sir, what I regard as simply ridiculous, and as a libel on the intelligence of those early aviators or airwomen (or would "Air-maids" as distinguished from "Mer-maids" be a better word?), is that the machine is represented with full spread wings at a great height from the very small wheel base, and in this state of unnatural instability is being carried along at full speed by the combined and furious efforts of three horses.

Is it not evident that supposing the three horses to be represented by M, and the speed to be 12 m.p.h., then $M \times 12 \times$ m.p.h. would give a pressure of 12 mm.p.h. on the outspread wings, which, having a surface of 16B, not taking the camber into consideration, would show a thrust of $\frac{12MMPHN}{16B} = \frac{1612}{BHUMPN}$, or 158 miles on each square circumference of wing surface at a height of X feet, which is absurd.

It follows that any person of intelligence must necessarily have recognised that such a thrust would be sufficient to have upset the whole caboodle, and that the proper way to convey the machine would be to lay it horizontally with the dihedral angle of the wings pointing to the front. The group therefore suggests in the most subtle manner that the early aviators were persons of no intelligence, and to allow it to remain in its present position is a libel on the brain power of the profession, which, I believe, has been purposely perpetrated by some of the more reactionary members of the War Office with a view to insinuating the superiority of balloons to ornithopters, and the general inefficiency of the heavier than air machine, with special stress on its unsuitability for transport in a 3-h.p. car.

May I ask you to use your great influence with the War Office to have this removed at once?—Yours indignantly,

Maida Vale. W. Le Maître.



Two Wolseley Engines (described on p. 164).

The Wolseley Engine.

A great deal of credit is due to the Wolseley engine, as it has the honour of being the first engine to succeed in making an Army Air-craft Factory-built machine fly. This is written without forgetting the de Havilland biplane, which was mostly built by the designer before joining that institution. The engine in question is of venerable age, and is a relic of the old Voisin on which the Duke of Westminster was so much photographed at the time when it was the fashionable thing to show an interest in aviation. Since then the engine has not appeared in public, though it, or one exactly like it, had previously done some excellent flying, driven by de Baeder in France.

The engine is an 8-cylinder V type, with cylinders $3\frac{3}{4}$ by $5\frac{1}{2}$ and is rated at 60 h.p. The cylinders are of cast-iron, with aluminium sections to the jackets, the aluminium being riveted on. This type of engine is now called a hydroplane engine.

It has been superseded as an aeroplane engine by a particularly handsome 8-cylinder V type, of the same bore and stroke, with steel cylinders and cast-iron combustion chambers screwed into them. The water-jackets are now of spun aluminium, screwed and jointed to the combustion heads, and closed at the bottom by a Dermatine ring. The inlets are automatic. Dual ignition is fitted. Lubrication is forced by tandem rotary pumps to the bearing. The pistons are of drawn steel with cast-iron rings at the top and two broad phosphor bronze rings below. Connecting rods, shaft, etc., are of nickel steel.

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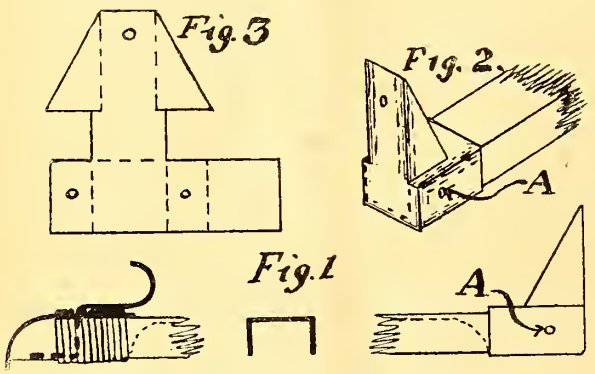
THE USE OF RUBBER MOTORS.

Having now dealt with the use of rubber as rubber, I propose to discuss its use in the form of a complete rubber motor, or rather pair of motors—for, as I noted recently, the use of a single propeller may cause confusion between the effect of warped wings and that of propeller-torque, while to gear one motor to two propellers is from every point of view to be deprecated.

For experimental purposes it is essential that the power plant should be complete in itself, so that various combinations of planes may be used with it. Also, to prevent the stress of the rubber from upsetting the flying by straining the fuselage, the struts which carry the motor should be distinct from the frame which connects the two planes.

There are two types of frames which may be used: a single strut with a Y frame, or a triangular frame with a strut close to each motor. Personally, I am a great believer in the latter, for a single-stick frame must always be weak at the point where the Y struts meet the main strut.

Fig. 1 shows one side of a frame of this kind, the whole frame consisting of two such struts, with a connection at the rear end. It will be observed, from the section shown, that the stick is ploughed or chiselled out to a channel section except at the ends, and it will be found best to have the webs of the channel on the side nearest the rubber. At the front end provision must be made for two things: the attachment of the rubber and connection with the other "leg" of the frame. The latter is in an unusual form, for a particular object. A strip of thin leather forms a hinge, which, while holding the two members together at their forward ends, enables their hinder ends to be opened or closed to take propellers of various sizes. The hook for the motor is made from a piece of steel wire, bent as shown, its inner end being sunk in a groove in the spar. The whole end is then bound with thread (*not* waxed), after which the whole spar should be painted with very good glue, thin and very hot. When dry it should be varnished (with celluloid varnish for choice).



The propeller bearing is made from a piece of thin sheet brass, as shown in Fig. 2, which gives a perspective view of the bearing fitted. Fig. 3 shows the blank, the dotted lines showing the bends. This should be bent up and neatly soldered, when it can be very easily slipped on to the end of the spar. It is there secured by the pins which fasten the cross-struts. The latter, which are not shown in the drawings, consist of two very light stream-line battens, placed one above and one below the main struts and pinned through, the pin passing through the hole A.

We now have a motor frame which is complete in itself, and can be attached to any machine. Several of these should be made, of various lengths and strength, each being provided with several pairs of rear struts, for use with different propellers.

Next week I propose to deal with the construction of the next item—planes.—P. K. T.

Reliable Goods.

The Aeroplane has recently had the pleasure of examining a complete model, and a set of parts, made by Mann and Grimmer, of Surbiton. The model, of course, is well known for its great efficiency, as shown by its numerous distance records, and to those who have seen it its lateral stability is wonderful: it is just as stable fore-and-aft, but in this case the reasons are obvious at a glance. The set of parts is singularly complete, and the components are very carefully designed, so as to entail a minimum of labour in assembly. If the present high level of products is sustained, this firm should certainly do well.

MODEL CORRESPONDENCE.

(Correspondents are reminded that space in these columns is strictly limited, and are therefore requested to make their communications as terse as possible.)

The Aero Model Club Movement.

Sir,—Mr. Johnson's letter surprises me, for I cannot pretend not to know his association with the model aeroplane movement. If he assumes that I "ran down" this movement in any way or took a "pessimistic view" he has failed to grasp my meaning.

I endeavoured to state truthfully the position of the clubs without prejudice. It is essential to be accurate, and Mr. Johnson must not think that I gave my opinion and figures without full knowledge of the subject.

Mr. Johnson bases his figures upon the fact that he receives communications from a number of clubs, and he judges their position from them. I not only entered into communication with several clubs but made personal visits to them, so learning their true position. These visits taught me that there existed several societies which only justified their name inasmuch as they flew "machines."

How they can be associated with the model *aeroplane* movement, or why certain influential individuals aid these clubs, I cannot understand, when the existence of such societies only tends to bring the movement into disrepute.

Can Mr. Johnson find anything in these clubs which promotes the science and sport of model-aeronautics? Can he imagine in a few sticks fitted with propelling plant and doing "quarters" and "halves" every Saturday afternoon anything which tends to benefit aviation or to demonstrate the utility of the aeroplane to the public, as was their object? In my opinion their existence is dangerous to the genuine club, for they give a wrong impression to the uninitiated, promote a pastime which is opposed to model aviation, and take interest away from that very important work of the aero clubs—the scale model.

Mr. Johnson mentions that he has a list of forty-four societies, and there appears in a contemporary a list of no fewer than 35 clubs! I may say that I could, perhaps, make up a list of 50 so-called clubs, but I would scarcely care to name even twenty-five *model aeroplane clubs* that are helping the cause. Would it not be advisable to make a distinction between the model *aeroplane* clubs and the clubs which promote "flying elasticks," for surely it is not advisable to publish the doings of such opposed societies, and it is easy enough to discriminate between them by a glance at their work.

The fact that the movement has been a failure in the past does not infer that the future will necessarily be the same. A large number of clubs has been inaugurated since my article appeared—and I sincerely wish them success—but the position remains the same, and if the outcome is to be success then they can study the causes of past failure and avoid them. Such I attempted to define in my article, and the concluding paragraph should prove that my sole intention was to ensure success, not hinder it. I sincerely hope that no other than Mr. Johnson would describe my view "pessimistic."

The "model" correspondence, as an outcome of your rider to Mr. Johnson's letter, up to the present has failed to elucidate matters. The secretaries of the successful clubs give their views, but the unsuccessful secretary is naturally ashamed to admit failure and does not care to answer your invitation.

Mr. Saunders' letter, therefore, came as a surprise, though his explanation of the failure—hardly creditable to some—does not surprise me, for I know that similar circumstances have caused other failures.

I cannot agree that the workshop alone was the trouble, though his remarks concerning members of the fair sex explain much. Mr. Saunders will agree that the cause of the failure was lack of good organisation. A club consisting of youthful members requires at least one adult leader to keep the unruly in order.

A well-equipped workshop under efficient control will do much to popularise model clubs. Many model enthusiasts find it difficult to work at home. But the workshop must be for

no other hobby than model aeronautics. Scale models are worthy of serious consideration, and after a little practice this work will prove more instructive than "projectile" building. As Mr. Clarke points out, "projectiles" have advantages over scientific machines because they lend themselves to propeller and wing-form testing, which is an argument in their favour.

In the Blackheath Aero Club is a club of the genuine kind still adhering to its object. Mr. Clarke can be congratulated upon his management, and if other clubs were to follow suit success would attend their efforts.

As far as "professional" model flying is concerned, it is a pity that such models as the "Bragg Smith," "Ding-Sayers," etc., are seen so seldom now, for whatever their faults they were scientifically built and decidedly were not "projectiles."

I should like to see more biplane and triplane models, for I can testify to the scope of scientific research; and though not so fast as the monoplane model, they are more closely related to their full-sized prototypes and justify their name as models.

It is not a question of breaking records; we are out to encourage workmanship, scientific building, and "improving the members' knowledge of the science of aviation." The last exhibition of the Blackheath Aero Club was a step in the right direction, and such meetings should be encouraged.

AERO-ASPIRANT.

Sir,—I quite agree with Mr. P. K. Turner in his article entitled "Useful Model Work," especially on model aeroplane experiments with different kinds of plane forms, etc. I will send sketch of an idea of mine, which I have on my latest model, which enables wings, tail, or rudder to be taken off and substituted by others, for experimental purposes or otherwise, within a few seconds, and at the same time the wings and tail or elevator can be put at any angle of incidence at will. Rudder can be bent round for steering. Of course, this idea chiefly alludes to the proper fuselage type of model.

Under the heading of "Aeroplane Design" I see several of your correspondents have suggested designs for improving the gliding angle of a machine. Why not make the angle of incidence of the wings and tail adjustable from the pilot's seat, so that if the engine should stop when flying over a town at a fairly low altitude, the wings could be tilted to make more lift, and the tail same to counteract the extra lift in front to prevent a tail slide? I have found this fairly successful with a glider. Wishing THE AEROPLANE every success.

Beckenham. HERBERT LEACH.

Sir,—In justice to ourselves we cannot allow Mr. H. W. Willis's letter to pass without comment. He says: "It was not a 'Mann' machine used" at Brighton on September 16th. It is no exaggeration to state that the "Mann" monoplane is the best known—and, incidentally, the most copied—model on the market, and that its general lines are unmistakable. Quite a number of enthusiastic aero-modelists were present at the meeting in question, and many of these have recently written to us to the effect that, as far as external appearances were concerned, the machine flown by Mr. Willis was undoubtedly a "Mann" monoplane. So like a "Mann" was it that not until months afterwards did Mr. Willis discover it to be something else; in fact, it was December before he began even to hint to the contrary. As far as we are able to discover, the model flown at Brighton bore the same relation to the "Mann" as most power-driven box-kites do to the Farman, and the sole factor to the contrary is the 50 secs. duration, which for a "Mann" monoplane is a very mediocre performance.

Surbiton. MANN AND GRIMMER.

CLUB NOTICES.

N.B.—Club Notes must be posted to 166, Piccadilly, to arrive not later than first post Monday morning, and should be as brief as possible.

Ealing and District Aero Club.—Meeting and discussion on 7th. Next meeting, 68, Pittshanger Lane, Ealing, 21st, 8 p.m. On 10th keen competition, propellers given by Mr. L. Roche for best average of three consecutive flights, without adjustments. Winner Master C. Roche, average 355⅓ ft.; Master L. Kirchner, second, average, 309½ ft. Messrs. Beeching, Esch, Chilcott, Grierson and Butler also ran. Mr. L. Roche broke club record for duration. Meeting Saturday at 2.30 p.m. —B. J. KIRCHNER, Hon. Sec.

Blackheath Aero Club.—Kidbrooke, Saturday, excellent flights by Messrs. Bailey, Conolly, Clark, Groves and Pizey. Lee Aerodrome, Mr. F. M. Bailey, Mr. H. H. Pizey. February 24th, 6 p.m., general meeting, Central Hall. March 9th, 3 p.m., point-to-point contest, Kidbrooke. Usual flying club grounds during week end. Details of membership from Assist Hon. Sec., L. BROUGH, 12, Manor Road, Brockley, S.E. ,,

Birmingham Aero Club.—Saturday Mr. E. Trykle on "How to make my model." Work on glider carried on. Best flights by Master Stamps, Master Jones, Mr. G. Baker and E. Trykle.—G. HADDON WOOD, Joint Hon. Sec.

Paddington and Districts Aero Club.—February 7th, W. Evans on "Selecting wood for models." Eighteen different woods tested, thus giving data not otherwise obtainable. February 10, Parkside, Carter, Wolley, Lane, Chalfont, Holden, Evans, and Davidson all flying. Models for workshop competition must be ready 7 p.m., February 17. Judges, Mr. Davis, of Twinings, and Mr. Hurlin, of Weston, Hurlin Co. Intending members write or call on Secretary, 133, Buchanan Gardens, Harlesden, N.W.

Bristol Model Flying.—February 10th, Howse's 1-1-P, 750 ft., perfect stability. Secretary's 15-in. 1-1-P, with wings "brought back," weight ⅞ oz., rubber 1-16 oz., 600 ft., but appeared dangerously unstable. Keyte's 1-1-2P, upturned wing-tips, 400 ft., "as if hung on wires." "Ideal Model Turbine" excited great interest. Meeting February 17th, 3 p.m., Sea Walls.—R. V. TIVY.

Hackney and District Aero Club.—Saturday last Messrs. Weston and Hurlin W. H. C. models doing ¼ mile across wind. Mr. Macbirnie doing well. Meeting, Mill Fields, Saturday.—B. H. LONGSTAFFE, Hon. Sec.

Brighton and District Aero Model Club.—Flying next Saturday at Shoreham. General meeting on 22nd. Communications to A. VON WICHMANN, Hon. Sec., "Kingsleigh," Kingsway, Hove.

Scottish Aeronautical Society Model Aero Club.—Friday lecture by Mr. D. N. Robertson on "Petrol Motors." Mr. McKim demonstrated new twin cylinder, opposed steam aero motor. Develops 1-10 h.p. and weighs 4 oz. Mr. Graham showed petrol motor. To morrow (Friday) Mr. W. J. Phillips on "Frictional Flight," Institute, Elmbank Crescent. Saturday, competition at Barrhead Aerodrome. Smoking concert, February 29th, Lansdowne Restaurant, Hope Street. Hydro-aero meeting soon.—J. S. GORDON, Hon. Assist. Sec.

MODEL ADVERTISEMENTS.

"M.S.C." PROPELLERS, beautifully finished, 1d. per inch up to 10 in.; postage 1d. Geared Winders 1s., postage 2d.—MURRAY, STANGER AND CO., 20, Brograve Road, Tottenham, N.

MODEL PROPELLERS.—Genuine CHAUVIERE, 8 in., 10 in., and 12 in. diameter, always in stock. GEO. W. GOODCHILD AND PARTNER, 30-32, Farringdon Road, London, E.C.

NEW CATALOGUE of Model Aeroplane Accessories now ready.—J. BONN AND CO., LTD., 97, New Oxford Street, London, W.C.

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"I RECEIVED your propellers yesterday, but owing to the cold only made three flights. Two were well over the quarter mile, and in one the machine flew clean out of sight."—(Mr. E. Hurlston, 1, Eskrigge Street, near Broughton, Manchester.)

THE FIRST THREE customers whose orders for either a pair of "Mann" propellers, Instructions and Drawings for Building a "Mann" Monoplane, or a dozen yards of "M. and G." Rubber, are opened on Tuesday, February 20th, will each have their money returned in full. We shall publish the three names and addresses. Last week 18s. returned to Mr. Walter V. Jones, 42, Roland Road, Handsworth, Birmingham.

RACING MACHINES, 18s.; Parts, 7s. 6d.; Propellers, 3s. 6d.; Wings, 3s. 6d.; Fuselages, 3s. 6d.; Scale Drawings,, 2s.; Elevators, 8d.; Fins, 6d.; Rubbers, 1s. 6d. dozen; Lubricant, 1s. 3d. Special New Line, "Mann" Popular Monoplane, 7s. 6d. This latter is cheap merely in price, and the materials and finish are of the highest possible quality. Everything post free by return of post from MANN AND GRIMMER, 15, Arlington Road, Surbiton.

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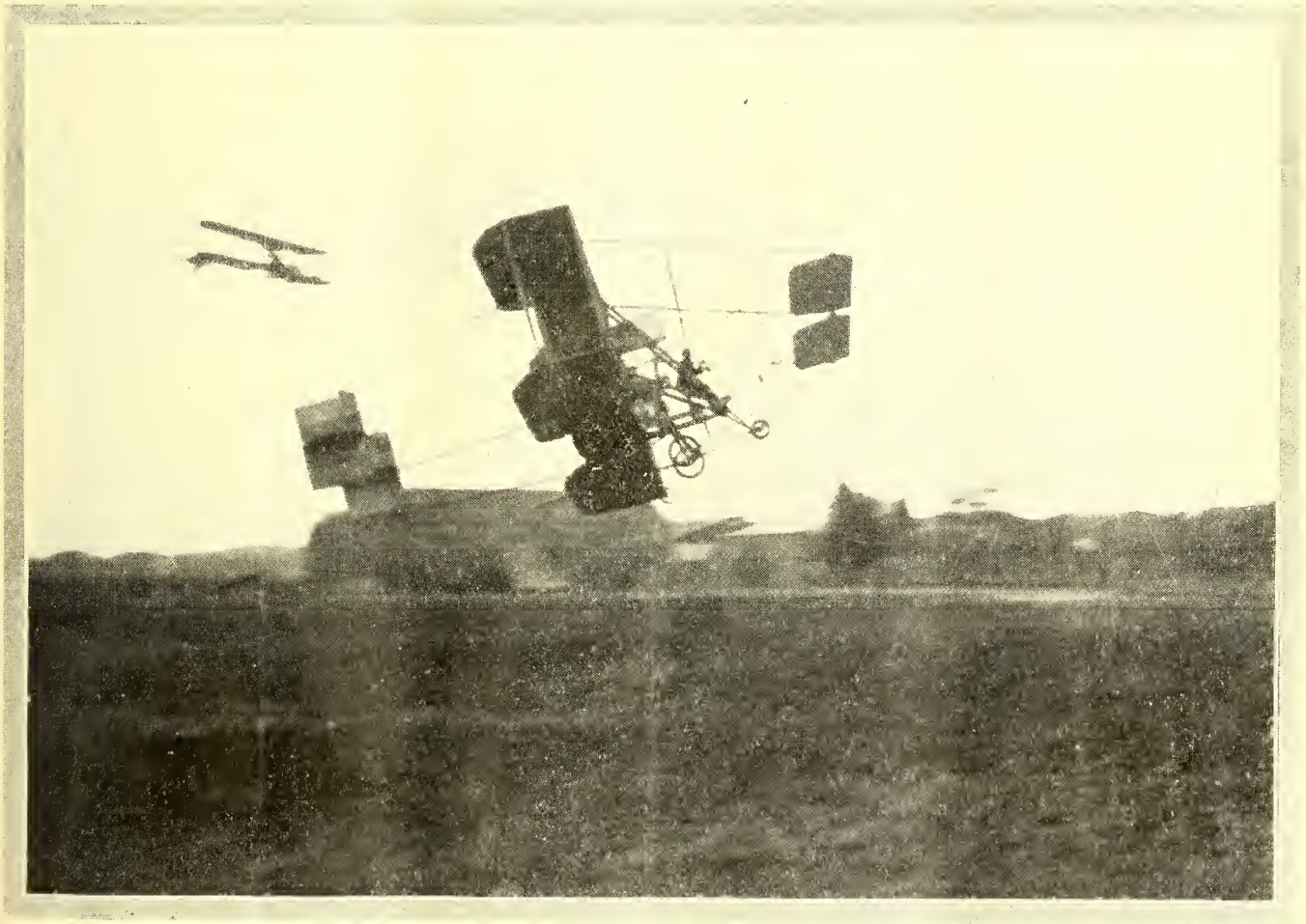
THE AEROPLANE

1d WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

VOL. II. [Registered at the G.P.O. as a Newspaper.] THURSDAY, FEBRUARY 22, 1912. No. 38.

"TWO HUNDRED FEET PER MINUTE" (PLUS ?)



Mr. S. F. Cody in one of his climbing turns at Brooklands on Sunday last. In the distance is Mr. Sopwith on his Wright. Mr. Cody's machine apparently climbs at this angle as long as required, and its rising speed is considerably in excess of the War Office requirement of 200 ft. per minute.

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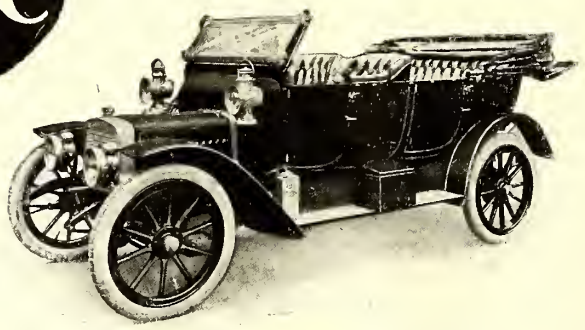

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MATTERS OF MOMENT.

WAR OFFICE ACTIVITY.

Those who have followed The Aeroplane's campaign in favour of an adequate supply of machines for the Army will remember that, at the time of the deputation of manufacturers to Colonel Seely at the House of Commons, it was announced in this paper that a number of machines would be ordered as soon as possible afterwards, without waiting for the military competitions.

It was, of course, hoped that these orders would be placed almost immediately, but, unfortunately, official orders take some time to pass through various departments, and the ordering of the machines was further delayed by the Christmas holidays and by the organising of a proper scheme of aerial defence.

However, this scheme is now practically completed, and a number of machines are actually being ordered at the moment. As the orders have not been officially placed The Aeroplane is not at liberty to say what makes of machines are to be bought, but it may be taken that orders are being very equitably distributed among British firms, though it is to be feared that when the official announcement is made there will be considerable disappointment in some quarters.

The fact that orders have not been given to certain firms is, it is understood, due to certain accidents which have occurred without the causes being thoroughly explained.

The Aeroplane is given to understand that this does not by any means debar any firm from future orders, but it is intended that, before orders are placed with such firms, any new and improved types evolved by these firms must be thoroughly tested under all sorts of conditions before any of them are purchased by the Government. It seems highly probable that before the military competitions start the War Office will have at least a couple of dozen machines. These will, it seems, be chiefly used for the big central Army school which is to be installed on Salisbury Plain.

It is also said that this school is to be a combined school for both the Army and Navy, though, in the opinion of many people well qualified to judge, it is a decided mistake to endeavour to combine the two. In the first place, although both Army and Navy pupils may work together amicably at a civil school, it will be quite another matter when the two Services are together in a Government establishment.

Though the officers and men of each Service may in their respective spheres be the best possible men at their own jobs, there is no getting away from the fact that the rivalry between the two Services is so keen as to generate distinct ill-feeling at times, and with the best intentions in the world little questions of discipline, seniority, and precedence are likely to crop up and lead to serious trouble.

Of course, the combined school must be more or less a tentative affair, and undoubtedly before many months are past there must be a number of aviation schools in various parts of the country; and when this stage of development arrives no doubt the Navy will have its own schools at the big naval ports, whereas the Army will have its schools as near as possible to the headquarters of the various commands throughout the country. It is undoubtedly a most satisfactory sign that all this activity should be about to start, and it seems quite probable that in twelve months' time much may have been done to overtake our rivals in the race for air power. Now that the movement is thoroughly under way, The Aeroplane is proud to think that it has done its best to assist the agitation, both inside and outside official circles, which has led to these results.

OUR PATRIOTS.

Among the papers which are doing excellent work to rouse the people of this country to an intelligent interest in the importance of aerial defence, the *Daily Express* has recently taken a foremost place, having of late devoted valuable space day after day to chronicling the doings of France and Germany in increasing their air fleets, and pointing out to its readers the importance of this country keeping on something like an equal footing with other Powers.

On Thursday last the *Daily Express*, having drawn attention to the fact that Germany's already huge vote of £640,000 for aeroplanes has been increased by a further £100,000 in response to the French vote of £880,000, and having demonstrated the enthusiasm of the French in raising private subscription all over the country to buy more and more aeroplanes, published an interview with Mr. Holt Thomas on the subject of "Britain's Handicap."

Mr. Holt Thomas very shrewdly pointed out that though we can purchase aeroplanes we cannot purchase pilots, and that of any given number of aviators trained to fly only a certain proportion proved to be really good cross-country fliers, but spoiled all his good effect by committing himself to the extraordinary statement that "what we want at the present moment is to put five hundred men in training as soon as possible on French machines, although they should be built in England." Incidentally, Mr. Holt Thomas is referred to in the course of the interview as "the pioneer of aviation in England."

Now Mr. Holt Thomas' qualifications as a pioneer apparently rest on the fact that he acted as M. Louis Paulhan's impressario by introducing (or should one in these days say "presenting"?) him to the London public at Brooklands late in 1909, and that in October, 1910, he persuaded the British War Office to purchase from France a Paulhan biplane, which was broken up after one flight, and never repaired, and a Farman biplane which has twice nearly cost us the life of Captain Burke, one of the ablest of our military aviators.

That Paulhan machine was, it is believed, the only machine Paulhan ever sold, and it was bought at a time when numerous other French machines had already proved themselves to be not only infinitely better than that particular machine, but really practical cross-country vehicles. The Farman machine was of a type which not long afterwards was given up by Mr. Farman himself in favour of a less slow and more controllable design, so that on the whole the evidence does not point to the choice of machines being made with the best of judgment, and, no doubt, if Mr. Holt Thomas had a wider acquaintance with modern British aeroplanes, both those actually in operation and those now in process of construction, he would scarcely maintain his belief that it is necessary to buy French machines for the British Army.

Even the proposition that they should be built in England does not impress one as being inspired by an intimate knowledge of present conditions, for it is obvious that before any French machines could be built in England it would be necessary for the firms with whom the orders were placed to secure adequate works, and train men to the special methods of manufacture necessary in aeroplane construction. Only one firm utilising French designs is so equipped, namely, the British Deperdussin Company, which is certainly turning out excellent work, and is in truth a British firm.

On the other hand, we have in this country, as has often been pointed out in The Aeroplane, a number of British constructors whose design and workmanship is fully equal to anything ever produced on the Continent, and in many ways is actually superior. Even those British firms who have made machines admittedly on French lines have improved them in detail, material and workmanship.

Such constructors as Short Bros., Vickers, Ltd., The Bristol Co., The Coventry Ordnance Co. (otherwise Mr. Howard Wright), Howard, Flanders and Co., The Aeronautical Syndicate, the Grahame-White Co., The Blackburn Co., Martin-Handasyde, Radley and Moorhouse, Mr. S. F. Cody, and others, possess trained men, practical knowledge, proper equipment, and every other facility for turning out machines quite as good as, if not better than, anything which can be built abroad, and very much quicker than any French firm could possibly turn the machines out if they had to organise new works over here.

If only those in this country who, like Mr. Holt Thomas, still believe in the absolute supremacy of the foreign manufacturer, would spend a little more of their time on British aerodromes, and a little less time abroad, we should hear less about this supposed foreign supremacy, and see a good many more British machines in the air.

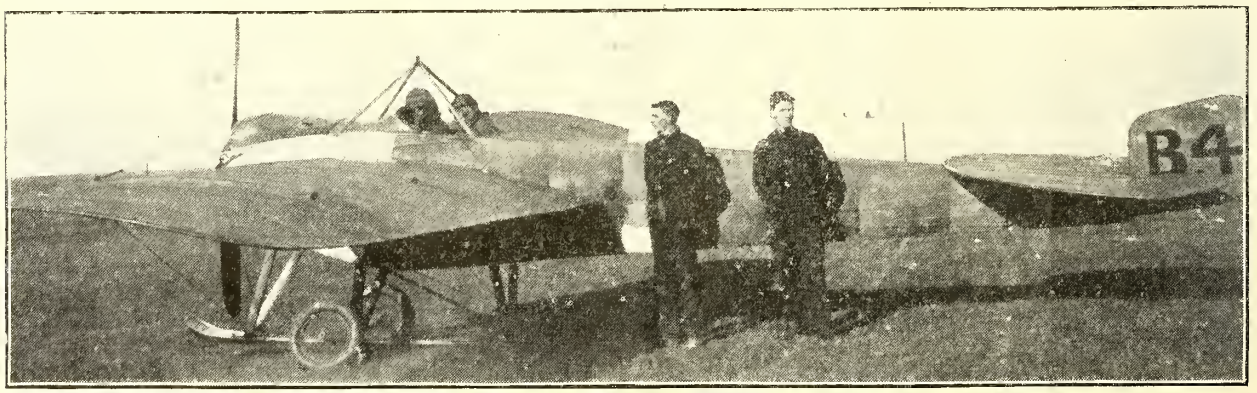
THE WAR OFFICE AND TERRITORIAL AVIATORS.

The latest peculiar edict from the War Office is concerned with the Territorials of the London Balloon Company. It will be recollected that a number of officers and men of this Company have of late been spending their own time and money in going down to the R.Ae.C. ground at Eastchurch, and learning both to fly and to handle the Short biplane, kindly lent for the purpose by a member of the Royal Aero Club.

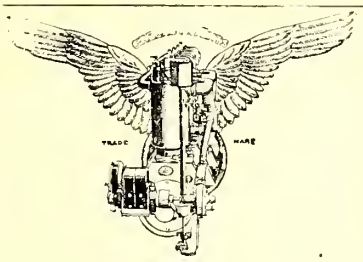
The cost of the railway fare and of lodging for week-ends at Eastchurch was naturally a somewhat severe strain on the finances of young men, who, after all, were working for the good of their country, so, apparently in an evil moment, the suggestion was made to the authorities that the time spent by the members of the Balloon Company at Eastchurch should count as drills, and that their railway fares should be defrayed by the War Office, just as the fares of ordinary Territorials are arranged for by the Government by means of special vouchers when they are going to camp.

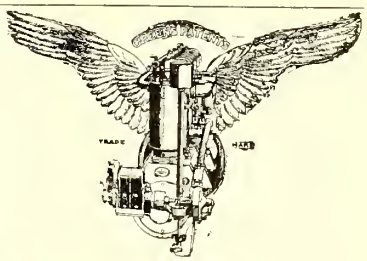
This suggestion was met with a flat refusal, and an Army Order was promptly issued that owing to a scheme for military aviation being now in hand at the War Office no further flying was to be done by the London Balloon Company.

Of course, there is nothing to prevent the members of the Balloon Company from going down to Eastchurch, either as members of the Royal Aero Club, or as guests, and continuing their work on the

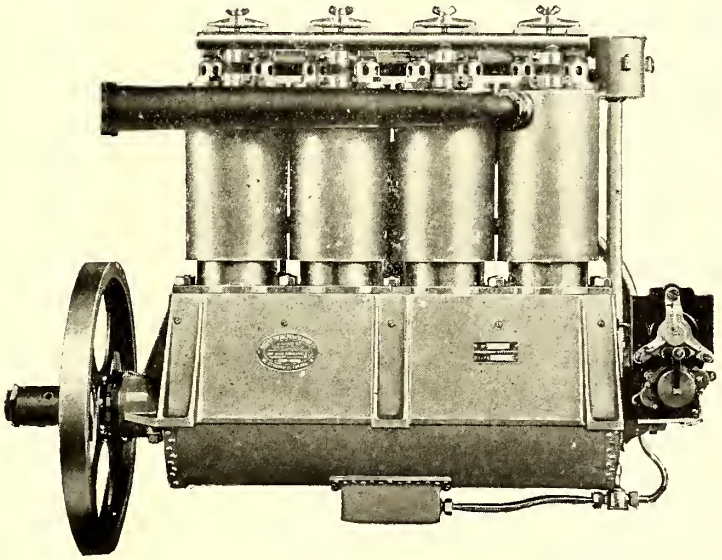


THE ARMY AT WORK.—Lieut. Barrington-Kennett on the Nieuport with Lieut. Hynes as passenger, starting for his first attempt on the Mortimer Singer prize.





BRITAIN'S BEST



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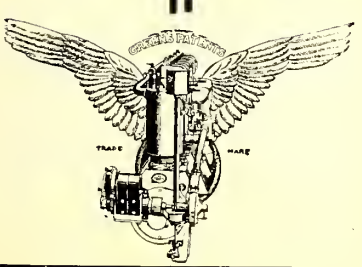
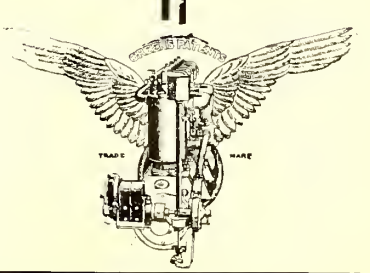




machine lent for the purpose, but as a company of Territorials they can no longer do so. It certainly seems peculiar that because the War Office is going to do something for Territorial aviation, therefore no Territorial may aviate. There is, of course, some sound logical idea at the back of the order, but official logic is often hard to follow.

A possible line of reasoning for this particular action is suggested to the writer by the case of a friend of his who was formerly a stock-rider in the Argentine, and had there learnt to keep his seat on anything with four legs. When the Irish Yeomanry contingent was being enlisted for South Africa he offered himself for service, and though an indifferent shot was duly passed as efficient in that respect. Then came the riding test, and after having been tried on horses of various grades of vice, none of which succeeded in throwing him, he was finally put on a horse which ended by throwing itself in its efforts to get rid of him. Yet, strange to say, he was failed for his riding, because, unfortunately, instead of riding with the long stirrup and straight leg beloved of the riding master, he insisted on riding short and hanging on with the calves of his legs.

There may, of course, be some analogous idea at the back of the mind of the official responsible for this Territorial order, for one can quite imagine that when the Army Flying Master is giving instruction to a squad of Territorials in the handling of their machines, and gives the order, "By your right, warp," it would be subversive of all discipline if the recruit under instruction insisted that he had been taught at Eastchurch to stabilise with his rudder and leave his warp alone.

Of course, there must be at the bottom of this apparently idiotic order a basis of sound common sense, but it would be much more satisfactory if one could discover what that basis is.

THE ROYAL AERO CLUB COMMITTEE.

In the course of a week or two the members of the Royal Aero Club will be asked once more to elect members for the committee which ostensibly governs the sport in this country, but which is, for good or bad, the centre of everything connected with aviation in the British Empire.

Unfortunately, it is the unpleasant duty of those really concerned for the good of aviation once more to be seemingly unkind to the Committee of the Aero Club.

Let it be granted at once that the Committee has done its best; that that best has been but a poor one is not the fault of the members of the Committee, but their misfortune. Also let it be said that, where organising work has had to be done by the club, and where Mr. Harold Perrin, the secretary of the club, has had that organising to do, it has been excellent. It is in the work of the Committee as a whole that the defects lie.

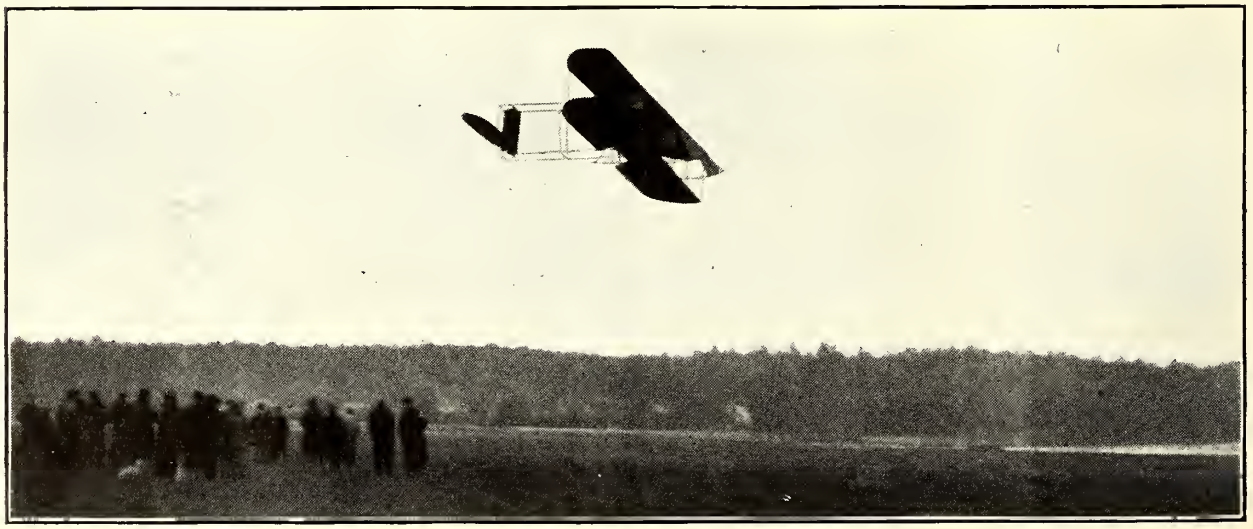
In spite of the predominating legal influence on the Committee, competition rules are full of ambiguity, as, for example, in those for the Manville competition and in the Mortimer Singer competition.

In practical work mistakes are made which the youngest pupil at an aviation school would regard as disgraceful, as, for example, the starting of the "Circuit of Britain" in a dangerous wind, and asking the competitors to get away in the face of a throng of people which was enough to break any aviator's nerve.

In matters of policy also the wrong thing is done, as when, at the meeting of manufacturers, an attempt was made to secure the nomination by the Committee of the club of the deputation to Colonel Seely. Fortunately, the manufacturing members of the club on that occasion refused to be beguiled into leaving their fate in the hands of the Committee, and proceeded to elect their own deputation, which they accomplished with excellent results.

A strange thing about this incident was that, though the Committee of the Royal Aero Club were *ipso facto* members of the deputation to Colonel Seely, only about two of the whole Committee had sufficient interest in the subject, or sufficient courtesy to their fellow-members, to attend as members of that deputation.

However, one personality was revealed on that occasion who may be the salvation of the club if he



Mr. T. O. M. Sopwith's Wright in a normal attitude at Brooklands. It will be noted that the crowd now encroaches on the ground and begins to need control.

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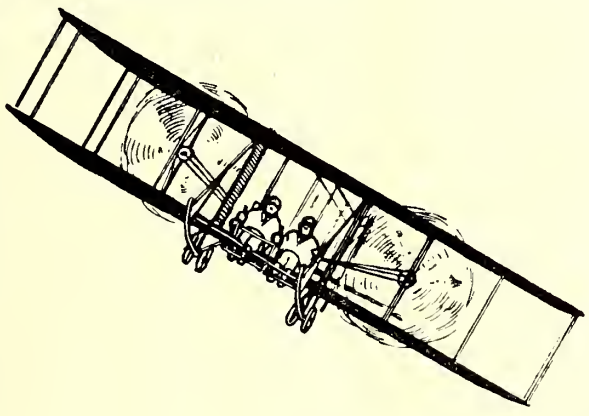


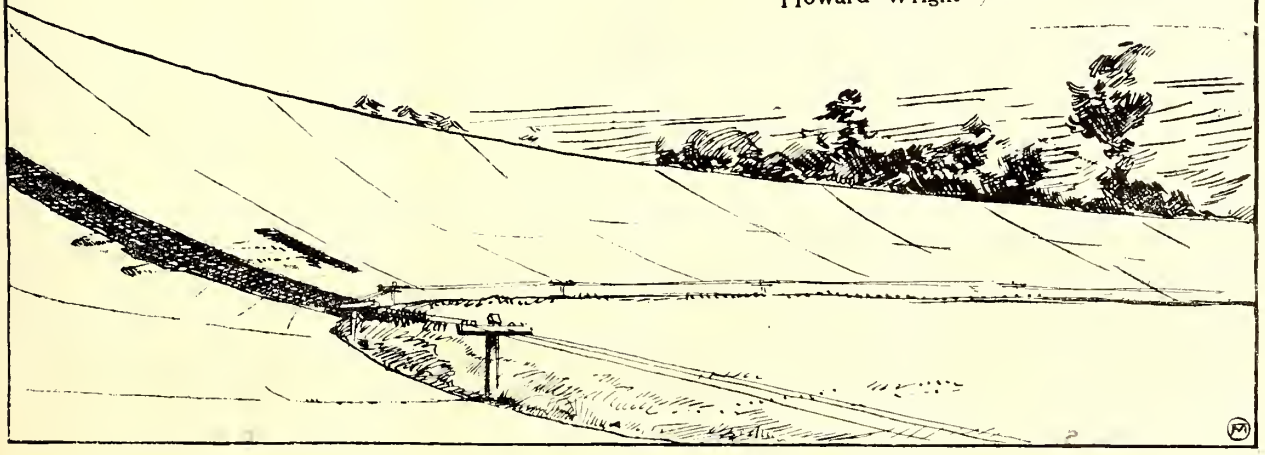
THE SCHOOL OFFERS

4

Entirely Different Types

American Wright, Howard Wright } BIPLANES with Dual Control

Bleriot, Howard Wright } MONOPLANES



can only be induced to take a more active part in its doings. The member in question was Sir Charles Rose, M.P., who not only presided over the meetings of the deputation committee in a way which earned for him the most sincere respect of every member, but showed him to be a man of tact and firmness far beyond the ordinary. He also has great influence in political circles, and it would be a very good day indeed for the Royal Aero Club if Sir Charles Rose could spare the time from his many activities and interests to become its chairman.

Not only must Sir Charles Rose, who is one of the retiring members of the Committee, be re-elected, but every effort should be made to persuade him to stand for the chairmanship.

Of the other retiring members, Mr. G. B. Cockburn, who was co-opted to the Committee during last year, must certainly be elected this year. Mr. Cockburn is a practical aviator himself, and one of the clearest thinkers and soundest reasoners connected with aviation in this country.

Mr. Ernest Manville, too, because of his good work for the club and his connection with the Society of Motor Manufacturers and Traders, should also be re-elected, as should Mr. Mortimer Singer, once a practical aviator and always a good worker.

Of the remainder of the retiring members of the Committee there seems no particular necessity to elect any one, if, as appears likely, candidates for election are forthcoming who are more in touch with the developments of modern aviation. It is true that all of them have done their very best according to their lights, but few of them are ever seen on an aviation ground, with the exception of Colonel Capper, who, of course, is himself an owner of an aeroplane.

Mr. Roger Wallace has, no doubt, done his best as chairman of the club for some years past, and one understands that his position as a King's Counsel gives much weight to his word when he represents the club on the Councils of the International Federation; but the future of the club is in this country rather than abroad, and there is no reason why Mr. Roger Wallace, as a private member of the club, should not be their representative at the meetings of the International Federation.

It is, unfortunately, true that the club needs a committee composed of men who are as closely as possible in touch with those who are doing the actual flying—men who are themselves conversant with the theory and practice of aviation, and who are thoroughly in sympathy with the individual members of the club.

The first name appearing in the official list of candidates for election is that of Captain J. D. B. Fulton, R.F.A., the first Army aviator to obtain his superior certificate, and the officer commanding the Aeroplane Company of the Air Battalion on Salisbury Plain. Not only is Captain Fulton a capital pilot, but he is a man of extraordinary ability in many other directions. He is a splendid organiser, very closely approaches genius in mechanical matters, and he is a born leader of men. At all costs Captain Fulton must be a member of the Committee, and it is only to be hoped that other candidates of equal ability in their own spheres will be forthcoming to take their places beside him on the Committee as ultimately elected.

A CRITICSIM OF "AVIATION IN THE NAVY."

I am much interested in Mr. Whittaker's article of last week, but as The Aeroplane invites criticism, I am emboldened to discuss his article *seriatim*.

It is news to me that Eastchurch is equipped as a naval aerodrome, for I am under the impression that the ground used is leased as the Royal Aero Club's aerodrome.

There is obviously no immediate intention of disbanding the Royal Marines, for fresh conditions of direct entry of officers to that corps have been recently issued, in view of an insufficient supply of Osborne-trained officers being available.

As regards organisation, naval matters appear yet to be in a greater state of flux than even the Air Battalion; but with the very large number of highly-skilled artificers available in the Service, and with existing arrangements for entering men from "outside," not much trouble need be feared as soon as the Navy have really got anything to organise.

I plead guilty to considering it an absolute necessity for cruisers to carry aeroplanes, as they will be perfectly useless from a scouting point of view if dependent on a necessarily small number of special parent ships. I believe experiments in America have shown the practicability of starting machines down a wire, which at once, if true, disposes of the "obstructionist" theory.

It does not seem that the naval aeroplane runs much risk of attack by air, as her range of vision is so immense and there is little need of close approach to the enemy; neither need she be much afraid of finding her parent cruiser in action on her return. At sea, under ordinary conditions, she will land in the water and be hoisted in; but in very bad weather, or to avoid delay, she may land on the deck, with much *bois cassé*. In time of peace it may be found possible to have a fair-weather landing arrangement of a sort of canvas shute, rigged on two wires aft, and as her floats will, of course, be hydroplanes and of use in smooth water, she will be an ideal means of bringing off the milk and mails. In any wind, however, the eddies caused by funnels, bridges, etc., would probably prevent my canvas shute idea from being much use—too dangerous.

A depôt ship, such as Mr. Whittaker suggests, would certainly be a necessary fleet auxiliary, and invaluable for repairs and maintenance in war time, and for peace training.

I think this all points to the use, for scouting purposes, of small, cheap machines, single-seaters. Small, because the space taken by a "popular" type monoplane or tractor-biplane with planes off is inconsiderable. Cheap, but not nasty, because structural strength is of first importance. She must have a good radius of action, and first-class air-worthiness. I do not think specially great speed is desirable, and doubt its being attainable if one is going to rise off even calm water and land on decks.

The question of scouting over hostile defended harbours points to the great desirability of close amalgamation of naval and military Services. I would even go so far as to say that the officers of either Service should have sufficient knowledge to be able in emergency to carry out the work of the other. I should expect that the military scout would find naval work child's play.

Now, sir, the foregoing applies to the use of the aeroplane as a *scout*; this is at present its only use, but the day is not far distant when the use of the aeroplane as an offensive weapon will absolutely revolutionise war at sea. Try and get this subject dealt with by the one man qualified by practical experience to discourse on it, namely, Mr. S. F. Cody, the father of British aviation.

"Ventre à Terre."

French Naval Aviation.

Maurice Colliex has during the past few days been making several test flights on the Voisin hydro-aeroplane, type Canard, which has been constructed to the order of the French Ministry of Marine. Starting from the surface of the water by the bridge at Issy les Moulineaux, he alights opposite Billancourt, again on the water. This he has completed in both directions many times, getting the details of the machine right by degrees. Towards the end of the month it is to be delivered to the Navy and is to be installed in the *Foudre*, stationed at Salins d'Hyères, where, under the orders of Commandant Daveluy and Lieut. de Vaisseau Cayla, a series of experiments will be made to determine the best methods of employing aeroplanes at sea.—W. E. de B. W.

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AIR CURRENTS.

"Ergaer."

This week marks an epoch in aerial science. The great work of The Learned Professor has been brought to a temporary conclusion.

On wholly unreliable authority is it stated that, while rashly revising, single-handed, the proofs of the first books, The Professor suddenly collapsed under the strain. It is said that he has been conveyed to London, and is at present seeking change of air and occupation on the Underground Railways. Rumour has it that he will remain below until his shattered nerves are somewhat restored. In his present condition he must be kept away from birds at all costs. He had a slight relapse on seeing an old advertisement of "The Blue Bird," which had been thoughtlessly left on the walls, but he is now steadily becoming convalescent.

The completion of the revision of the proofs must therefore be awaited until such time as The Professor is again able to risk beholding anything with wings—even a motor-car.

We say proofs, but do not let us be misunderstood. The work does not set out to prove anything. It presents facts and arguments, but it draws no conclusions. The present conclusion is merely temporary. There will be no conclusion about it. It will go on for ever—provided The Professor is spared to us.

If he is not, the work will be his monument. It is a monument—a monument of facts—a monument to the inventive genius of The Professor. It is not a thing to be taken round in the carts of newsagents, which explains why we have not published it in this journal; it is a thing to which one should pay a pilgrimage.

It is hoped that when really concluded it may be on view here, under glass, from ten to four, on presentation of visiting card. Students' days, Wednesdays and Fridays.

It has all the fascination of an Arsène Lupin novel, without any unhealthy excitement. From the first chapter there dawns upon the reader's mind a feeling that he is about to be initiated into a profound mystery. As the chapters progress, and he penetrates deeper into the unknown, that feeling becomes conviction.

And what has The Professor disclosed? He has disclosed—"Ergaer."

"What is it?"

Is it the newest of meat extracts, or the latest of waltzes?

Is it a "pick-me-up," or is it merely an antifat preparation?

It is neither—yet it is all four.

It is nothing—yet it is everything.

It is invisible—yet it is everywhere.

"What is it?"

The reader may well ask that question, but he must wait for a satisfactory answer till The Professor returns. He alone knows. And even he has doubts.

It is not, however, a riddle.

But the name affords a clue. It is surmised that it is taken from the French. Most aviation names are. As we have the whole of a French dictionary at our finger-tips, we are able, without referring to one, to give the following information:—

Egayer, v.a.—to cheer up, to exhilarate, to thin; *s'*—to make one's self cheerful or merry, to divert one's self.

Making due allowance for the usual English accent, we would seem to have the answer here.

It is the direct opposite of gravity.

Details are, unfortunately, lacking at present. We can but surmise. Will it completely annihilate gravity? We cannot ourselves think so. The suggestion is, to our minds, farcical. We do not wish to treat the question with undue levity. We are inclined to think, if anything, that it will be a partial eclipse—half gravity, half levity.

Will it be patented? We do not believe we are misrepresenting The Professor's views when we say that there is doubt on this point, he not being certain whether it is a substance or—so to speak—only a way of putting it.

Assuming (once more), however, that it can be reduced to a substance, are we to conclude that it will be put on the market?

If so, things ought to rise. Depreciation of capital, however, and falling credit, are not the only considerations. There are others. The thing is too universal. It might be (to take the four cases we have selected at random) cheering and light of digestion in a meat extract, enlivening in waltz shoes or rubber heels, exhilarating and elevating as a "pick-me-up," a successful weight reducer as an antifat preparation; but would its use tend to make a light-headed nation of us?

And this is but one question in a thousand that present themselves. Would an overdose make one soar?

It is obvious that it is not a thing to be lightly manufactured and distributed over the face of the earth. It involves weighty questions.

As Shakespeare is said once to have remarked: "There are more things in Heaven and Earth, Horatio. . . ."

Frank A. Gibson.

Aerodrome Types.

VII.—THE PESSIMIST.

He is not only confined to aviation circles. If he were it might be possible to arrange a kind of comprehensive *auto da fé*. "Mr. Blank will execute his successful *vol pancake* turn. All pessimists cordially invited," might appear on the bills. Mr. Blank would no doubt be able to account for quite a respectable number of victims and his comrades likewise. But this is mere idle dreaming.

He exists then *partout*, but the aviation species is a very malignant type.

Strangely enough, the weather always seems to outdo itself on his behalf. He has in all conscience quite the rottenest luck. If he plans out a day at an aerodrome, it either pours from morn till dewy eve, or if fine it is so aggressively hot that flying is out of the question even for those who generally spend their time asking for trouble. In these cases, of course, he has cause enough to grumble, but he is really rather pleased than otherwise, for he is then able to point out the state of things as his usual luck with great aplomb.

He tells the world at large that flying machines will never be any use really, far too dangerous, etc., etc., and he quotes the number of aviation disasters with many sighs and shakes of the head.

When you are ready to start up for a flight he approaches with a face which is quite the last word in lugubriousness, and proceeds to inform you that your machine is no good at all, and that your chances of keeping your neck intact while flying it are remote, to say the least of it. He relates stories of all the accidents he has ever heard of with a passionate delight in gruesome details. It is not that he exactly expects you to take out your machine and jump on it, and forswear aviation for ever: he just can't help himself, that's all.

A refractory engine is just what he expected, and even when you have coerced it into good behaviour, he tells you he will only give it so or so long before it breaks down again.

He is perhaps rather amusing at first, but it becomes wearing after a bit, and you begin to speculate what kind of sudden death would be most appropriate for him and most gratifying to yourself, which brings us back to where we started from.

Blatant optimism makes no impression on him at all; indeed, he is inclined to think you are tempting Providence by such a calm indifference to the very worst.

He is the kind of person who would like to see you equipped like the White Knight in "Alice in Wonderland" on the "it's as well to be provided for *everything*" principle, and some of the contrivances he would like you to adopt are not a whit less absurd than the White Knight arming himself against shark bites in a wood.

After all, it is possible to be reasonably cautious without anticipating battle, murder, and sudden death, but our friend cannot see things in that light.

We can only hope he gets *some* amusement out of it all, because we get a good deal out of him, being, we trust, most of us possessed of that saving grace the dear man so badly needs—a sense of humour.—D. M. H.

The Most Unkindest Cut.

"Congratulations to Mr. Cody, who beat Mr. De Havilland in an air race at Aldershot yesterday. It is only fair to Mr. De Havilland to add that he was mounted on an Army aeroplane. Mr. Cody's 100-h.p. Daimler engine averaged nearly seventy miles per hour, which is quite a useful speed."—*The Evening News*, January 27th.

The Difficulties of Designers.

One of our most serious designers was recently discussing with an equally well-known constructor as to the advisability of lightening the machine they were building by leaving large holes in certain parts. The constructor argued that one particular hole was unnecessary. Said the designer: "But, my dear sir, if that hole wasn't there it would weigh pounds." Then the argument drifted off into the ponderability of non-existent vacua.

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The Triumph of British Workmanship.

Once more the Green engine has demonstrated its wonderful capabilities, and it is only fit and proper that after its triumph in the Michelin Cup Competitions and in the "Circuit of Britain" it should now carry off the Patrick Alexander Prize. Though the competition took place so long ago as December 20th, the composite committee who had to adjudicate has only just now announced its decision, presumably on the principle of the "many cooks." However, the Green engine has now been officially declared the winner of the £1,000 offered by Mr. Patrick Alexander, and Mr. Alexander himself has signified his personal satisfaction at the award.

It will be remembered that in the Alexander Competition of 1910, which was for engines of 35 h.p., the Green engine did not strictly comply with certain of the conditions. Nevertheless, its performance was so excellent that Mr. Alexander presented it with a prize of £200, this being the only award made in the competition, and the Aerial League presented a silver medal for excellence in workmanship. This year the competition was open to the world for all engines of from 40 to 75 h.p. The test was made at the Army Aircraft Factory at Farnborough under the supervision of officials of the National Physical Laboratory. In order to give some semblance of real flying conditions the test was run in a wind-tunnel through which a 30-m.p.h. breeze was blowing, but this speed was so obviously less than the actual speed of a modern aeroplane that the Green Engine Company thought it wise to use very much bigger radiators than would be used on an aeroplane. Seven entries were received for the competition, one of them being from America.

The test started at 10.12 a.m. on December 19th, and the engine was shut down at 10.12 p.m. for 12 hours. The next 12-hr. run was also started at about 10 a.m. on December 20th and completed at 10 p.m. It will, of course, be noted that two 12-hr. runs in this way are very much more severe a test for an engine than 24 hours straight on end, in that the engine has time to cool down, and may develop trouble in doing so. However, the Green started up for her second test at the very first turn, and ran without a fault throughout.

The engine used was of the standard type four-cylinder vertical, 140 by 146 mm., fitted with auxiliary ports; and during the test she developed 61.6 h.p. at 1,150 r.p.m., against the minimum of 58.5 h.p. allowed by the regulations from the declared brake horse-power.

The regulations allowed stops amounting to 30 mins. for adjustments, but no stop was made. The power was measured electrically, the revolutions being counted every ten minutes, both electrically and direct. During one period of 4 hrs. the revolutions only varied four per minute between maximum and minimum, which shows astoundingly even running.

On December 21st the further tests were carried out. In the tilted test with the propeller end of the engine declined 15 degrees the engine gave 60.4 h.p. at 1,125 r.p.m. without any alteration in the throttle from her previous run. At the end of the hour the engine bed was then declined sideways at 15 degrees, and the engine proceeded to give 62.3 h.p. at 1,156 r.p.m., the difference in horse-power being presumably due to some slight alteration in the carburation owing to the current of the wind passing the engine at a different angle. The engine was then opened out for a full-power test, and gave 67.8 h.p. at 1,210 r.p.m. for 7 mins. At this power the engine shows a weight of 5.5 lb. per b.h.p. She thus completed 26 hrs. and 7 mins. running without an involuntary stop, but with four compulsory stops—a truly marvellous performance.

During the entire test the engine ran over 2,000,000 revolutions without a misfire of any kind, and the whole performance is undoubtedly a world's record for any type of internal combustion engine.

The total petrol consumption in the 12-hr. run was 435.4 lb., which gives a petrol consumption of .59 lb. of petrol per b.h.p. hour. The oil consumption for the 12-hr. run was 130 lb., or .175 per b.h.p. This appears to be high, but it is accounted for by the fact that the oil supplied to the auxiliary ports was excessive, and a thick smoke was visible from the wind tunnel during the whole trial. It was, however, impossible to adjust this oil, owing to the regulations not permitting any part to be touched during the run. Under ordinary circumstances the oil consumption is regulated by the pilot according to whether the engine is pulling full load or not, and many tests in actual flying show that the oil consumption for an engine of this type is only 4/5ths of a gallon per hour.

It should be added that the engine was minutely examined at the conclusion of the trials, and there was no visible sign of wear of any working parts.

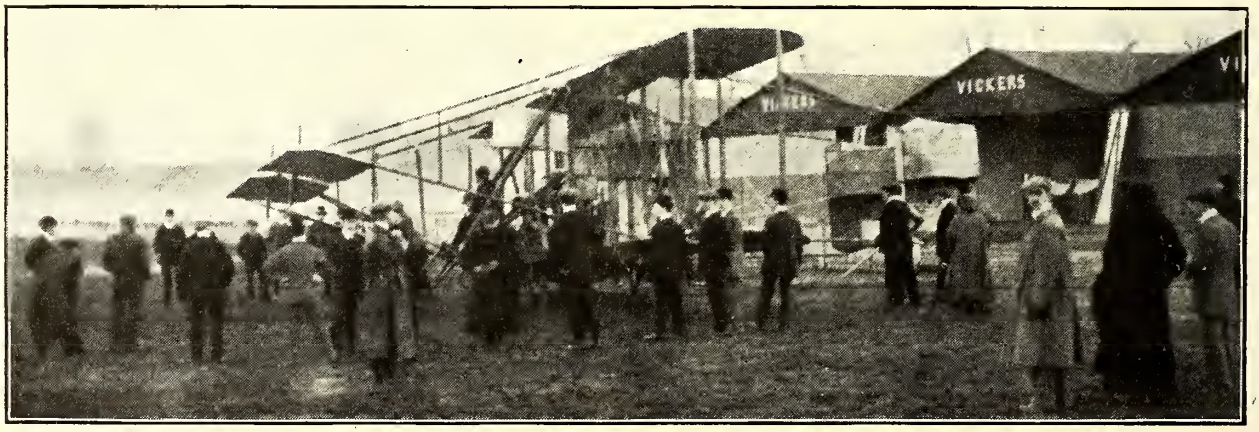
Surely after such tests even the most infatuated adherents to alien engines cannot claim that British engines are unworthy of attention, and one only wishes it were possible to subject some of the popular French engines to a similar test. One thing is certain, namely, that their fuel consumption would be immensely higher, and consequently the weight of the whole power plant at the start would be immensely higher than that needed for the Green. It is also very doubtful whether most of the foreign engines would stand two 12-hour runs without having to be taken to pieces between them.

For military work fuel consumption must be necessarily a most important item, and it is only to be hoped that the Army will give the British engine a really fair trial.

One of the conditions of the test was that the National Physical Laboratory have the option of purchasing any of the engines submitted for the Alexander test on the completion of the test, and it may be presumed that in this case they are satisfied that the Green engine, at any rate, would be a good investment.

Mr. Green and Mr. Fred May, who are the chiefs of the Green Engine Company, deserve every congratulation on the result of the trial. The actual performance is no more than some of us who know the Green engine expected all along, but the publication of the performance will, it is hoped, enlighten some of those who are not so closely in touch with what British engines can do.

We now await with pleasant expectation the arrival of the six-cylinder 110-h.p. Green which is promised in the course of the next few weeks. The performance of the 60-80 shows that the material is right, and the 110 is merely the same engine with two extra cylinders and a few minor improvements, so that it may be accepted with confidence on the performance of the smaller engine.



Mr. S. F. Cody preparing to leave Brooklands for Farnborough on Sunday. In the centre may be seen his passengers Messrs. Charteris and Howard Flanders buttoning their coats ready for the start.

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IN MEMORIAM: Douglas Graham Gilmour.

By the death of Douglas Graham Gilmour on February 17th British aviation has received its worst blow since the loss of Cecil Grace. Although Gilmour had the reputation of being a particularly daring flier, and gave some people the impression that he was utterly reckless, he was in reality one of the most careful of men, and to his untiring arguments in favour of proper strength in working parts is largely due the custom in most British aeroplanes of doubling all control wires and wing stays. Those of us who knew him well were always confident that he would never have an accident through bad or even careless flying, for no aviator ever knew better exactly what he could do with the particular machine he happened to be flying. It is therefore some small satisfaction to know that he met his death in a plain straightforward accident when doing an ordinary cross-country flight, and not through the trick-flying of which he was at times so fond. I therefore take the strongest exception to the statement, credited by the Press to Mr. Roger Wallace, the chairman of the Royal Aero Club, that in the opinion of experts my late friend was a reckless flier.

About eleven o'clock last Saturday morning he telephoned to me from Weybridge to tell me he was going to take a trip down the River through the City, and asked me to get a cinematograph firm to look out for him at one of the bridges. He enquired what the weather was like in town, and in his usual cheerful way said: "It's simply a ripping morning down here. Hot as anything. There'll be some 'wully-was' up aloft, though." Poor Gilmour always scorned the French word *remou*, and used the good Scots "wully-wa." Then he chatted for a few minutes about the route he was going to take, and about showing his beloved monoplane to the Londoners; and, with a cheery "Good-bye, I must run over to help to get the machine out," went off. An hour later came the news that he had been killed.

In the Old Deer Park at Richmond I found the wreck of his machine, and was able to gather some of the facts of the accident. Gilmour, coming from Brooklands, had passed over Hampton Court and Richmond Bridge, following his usual course, evidently intending to cut across the open ground over the Old Deer Park and Kew to Mortlake before following the River into London. When just over the South-Western Railway, which borders the Deer Park, he was seen to dive slightly from about 300 feet, as if about to land. A moment afterwards the right wing was seen to give in the middle—at least that is the definite statement of my informant, a very clear observer, and he is corroborated by others. The machine swung round, seemed to recover itself for a fraction of a second, and then the other wing went, the two wings folding back and upward. At once the machine dropped straight on its nose, burying the engine in the ground till only the two rear pairs of cylinders were left above ground. The whole fuselage turned over, so that the machine was apparently lying on its back, though nothing was broken aft of the passenger's seat. The wings were mixed up hopelessly with one another, and neither wing-tip showed any evidence of hitting the ground; also there was no mud on the landing wheels, which were intact, and the front skid was buried deep in the earth, thus proving that the machine fell straight on to its nose, and that both wings had collapsed, for if one had held together the machine must have landed on one side, and one wing-tip or other must have hit the ground.

Now, the extraordinary thing is that not a single important wire on the machine is broken. All the wing wires were intact, all the warp wires were untouched, the control wheel, its pillar and the elevator-rods were sound and unbroken. One link of the warp chain was broken, but this was probably snapped by the shock, for its duplicate had not gone, and the warping gear could not be put out of action by one link breaking alone, for everything was doubled, as was poor Gilmour's custom. The safety belt, which Gilmour always used, was broken, but it evidently broke at the last moment, for he was picked up right below the driving seat, lying on his face under the fuselage, and was apparently not thrown out of the machine. The medical evidence shows that any one of half a dozen injuries would have been enough to cause his death instantaneously.

What was the cause of the accident will, of course, never be known, and one can only surmise that there must have been some undiscoverable flaw in the wood of one wing, though this seems almost impossible, seeing the size of the spars and the care with which Martin and Handasyde select their material. Further, the king-posts of the wings have an enormous factor of safety, and the wing spars alone are strong enough to stand the load without the stays from the king-posts outwards. The whole thing is an inexplicable mystery, and must simply be put down as one of those accidents which must happen once in a while, despite all that human foresight can do to prevent them. Such accidents still happen now and then even to railway trains and motor cars, only as experience is gained they become more and more rare. Everyone, even the most critical, admits the strength of the machine, and is full of sympathy for those splendidly plucky workers, Martin and Handasyde, who have by the accident lost a very dear friend.

Personally Douglas Gilmour was one of the most lovable people I have ever met. A Celt of the Celts, he had a fine Scottish contempt for the Saxon and all his works, and like most quick-witted men, did not suffer fools gladly. Though he disliked being called Graham Gilmour, especially if spelled with a hyphen, he rather prided himself on his descent from

The Wreck of Mr. Gilmour's Machine.

the great Graham of Claverhouse, and in his general manner and methods he undoubtedly threw back to the Highland chieftains of some hundreds of years ago. This manner of his made him unpopular with a certain section of those who are unfortunately concerned with the governing of aviation in this country, who tried to bully him into a spirit of humility instead of treating him as a friend and equal.

As a matter of fact, treated properly, D. G.—as his own friends called him—was one of the easiest of persons to move in any direction, except on the theory of flying and the construction of aeroplanes, on which subjects he had certain sound and fixed beliefs which have had quite a good deal of influence on the progress of aviation in this country.

His kindness of heart and gentle tact with those in trouble was wonderful, and to show this I can now tell a story which I could never have told during his life. At the start of the "Circuit of Britain," when poor D. G. was sufficiently worried by his own affairs to be excused from bothering about anyone else, he learned that a young friend of his had lost his mother, a lady who had been kind to D. G. herself, and was left practically penniless. D. G. came to me and suggested that I should find room for the lad in my office. I explained that the staff was already as big as was needed; whereupon D. G. said he knew that, but he could not give the boy money direct, and if I could find mere room for him in the office, he would pay his wages through me, only he must never know who was doing it. Fortunately, however, D. G. was able to find the lad a job elsewhere, for I know that he himself was by no means rolling in wealth at the time. Such a proposition as that could only come from a very kind and tactful man, and it was typical of Gilmour's nature.

Douglas Graham Gilmour was born at Dartford in Kent on March 7th, 1885, and was, therefore, just under twenty-seven years of age.

He took his aviator's certificate at Pau, the certificate being No. 75 on the French list, and dated April 19th, 1910, though as a matter of fact his qualifying flights were made some two months earlier, so he should by rights have been among the first twenty-five aviators in the world. He took his certificate on an Anzani-Blériot. Then he flew a Blériot with a J.A.P. In 1910, after the Lanark meeting, he joined L. D. Gibbs and Co., as it then was, and flew the *Big Bat* and the old Sommer. Later he joined the Bristol Company, and did more than any one pilot of that period to boom aviation and his firm by his sensational flights down through the City, over the Boat Race, and at Henley, which last performance resulted in his suspension by the Committee of the Royal Aero Club, just before the "Circuit of Britain," a piece of work which might have been avoided if the Committee had possessed less law and more tact. His cross-country flights are too numerous to mention, for he was a regular aerial tourist, and we are not likely soon to find an all-round flier to take his place.

I think Gilmour died as he would have wished, and as he expected to die, in a genuine accident without contributory negligence by anyone. And when he set out on his fatal flight he did so with the intention of doing a good turn to his friends Martin and Handasyde. He did not even tell them of his intention, for he wanted the action to speak for itself. Almost his last words to me on the telephone were, "It's about time they had a decent show, and I'm going to give it to them." He died doing his best for his friends, he died fighting, and he died quickly. What more can man ask? Dear old D. G. May he rest in peace.—C. G. G.

"D. G."—as we knew him.

A Memorial to Douglas Gilmour.

It has been suggested to the writer that some form of memorial should be raised to our late friend. The suggestions range from a memorial stone at the point where he met his death to the endowment of a bed at a hospital, or the purchase of a war-plane for the army. The form a memorial may take may well be left in the hands of a committee formed for the purpose, but certainly something should be done in this way. The Aeroplane will do its best to assist any fund raised for this purpose, and suggestions, with or without subscriptions, may be sent at once to 166, Piccadilly, where they will be handed over to the committee when formed.

Mr. Dunne's Illness.

His many friends both on the scientific and practical side of aviation will regret very much to hear that Mr. J. W. Dunne, the inventor of the Dunne automatic stability machine, has been seriously ill at his home at East Minster. Mr. Dunne has been suffering from pneumonia, and for two or three days his life was almost despaired of, but thanks to able nursing and the assiduous care of his mother, Lady Dunne, and his sister, he is now well on the road to recovery.

An Accident to Mr. Herbert Thomas.

One of the most popular personalities of the excellently staffed Bristol firm is Mr. Herbert Thomas, at one time our youngest aviator, a cheery young sportsman, and at the same time a really serious, hard worker at his job in the Bristol works. It is therefore with the greatest regret that one hears he had a very serious accident on Saturday last, and at the time of writing lies in a precarious condition. It appears that he was superintending the tuning up of a two-cylinder Clement engine, intended for use in a school taxi, when either the propeller burst or the bolts holding it to the shaft sheared. In any case, the propeller flew off and a blade hit Mr. Thomas on the head, laying his forehead and the top of his head open.

It was at first feared that he would not live through Saturday night, but it was reported on Monday that he was doing as well as could be expected. The Aeroplane, on behalf of all, wishes him an early and complete recovery, and tenders sincere sympathy to Sir George White, Mr. Stanley White, and Messrs. Sydney and White Smith in their anxiety about their popular young relative, as well as in their other troubles of the week-end, for Captain Gilbert de Winckels' accident is a very serious business, and Mr. Bower's smash with the other two-seater monoplane on Sunday night might well have been a bad affair,

The French Army Estimates.

The French Military Estimates were presented to the Senate on February 13th, and the plans and expenditure dealing with military aeronautics were outlined by M. Millerand, Minister of War. The aerial policy of the French Government is now stated clearly for the first time. As forecasted in the Parisian press, a sum of 22,000,000 francs (£880,000) is to be expended during the coming financial year on the formation of a compact aerial force. The Air Corps at last takes its place in the organisation of the French Army.

While the greater portion of the grant is to be devoted to the purchase and upkeep of aeroplanes, dirigibles are not to be entirely neglected. Fifteen of the latest type are to be constructed, and, though this is a matter of rumour, are to be stationed at strategetic points on the frontier, such as Toul, Epinal, and Verdun.

Two sentences of M. Millerand's speech may perhaps be of interest to those who control the destinies of the British Army: "Aviation belongs neither to the artillery nor the engineers, but to the entire army and the country," a sentiment which was received with loud applause. Later in his speech he said, "Men will be recruited for the air force from *all arms*; it is an essential principle."

The French General Staff has decided that the unit of aviation shall be the "escadrille" consisting of eight aeroplanes. Each escadrille will have three sections, one of single seaters, one of two seaters, and one of machines carrying several people. A reserve will also be formed to each escadrille. Seven pilots will be attached to an escadrille. The number of mechanics and soldiers attached is indeterminate. For transport each escadrille will have twelve motor cars, with some motor tractors, a motor-driven repair wagon, and one fast motor car. According to M. Millerand the French Army has in its possession 208 effective aeroplanes, to which will be added during this year another 344. It will then be possible to form another 27 field and 5 garrison escadrilles. The officers and men attached to the Air Corps will be as follows: 234 officer pilots, 210 observers, 42 mechanics, 110 "sous-officiers," 1,600 sappers, and 550 soldiers.

It is intended that each army corps (which in France consists of two infantry divisions, one cavalry brigade, four brigades of field artillery, 48 guns, one battalion of heavy artillery, and one company of engineers; in all about 40,000 men) shall have attached to it an escadrille of aeroplanes. The number of aeroplanes to be allocated to the artillery and the manner of their allocation will be decided after the manœuvres in March.

The escadrilles of each army corps will be under the direct control of the general officer commanding, who is expected to familiarise himself with military aviation. The air corps is to be decentralised, and will depend for its training on the dispositions of the general commanding.

Thirty aviation centres are to be formed before the end of 1913, complete with aerodromes, hangars, workshops, stores, hospitals, and lecture halls. Each of these centres will be under an officer who will have complete control—administrative and technical. A large number of canvas portable hangars will be purchased for use on active service.

Pilots will be trained both in civil aerodromes and in the military centres. Observers, naturally, will be trained in the military centres only. Compensation will be given in case of accidents both to pilots and pupils. As M. Millerand puts it, "the wounds (of aviation) will be considered as wounds of war."

M. Millerand's speech was received with much enthusiasm, and gratification was expressed at the policy outlined in it. M. Reymond, the aviator-senator, whilst approving of the general scheme, insisted on the absolute necessity of separating the Air Corps from other branches of the Service. He also pointed out that General Roques, Inspector-General of Aeronautics, had on his staff officers who could not fly, and, moreover, were unwilling to learn. (There are other armies in which similar conditions prevail!)

M. Monis, an ex-Premier whose fall from power was indirectly due to an aeroplane, also impressed on the War Department the advisability of removing the Air Corps from any possibility of interference from the Engineers.

It should be noticed that the figures given by the Minister of War as to the number of aeroplanes in use and to be acquired do not fit in with the number of escadrilles he intends to form. Presumably a great many aeroplanes are to be drafted to the reserve. Another ambiguity is that while he speaks of the escadrille as the aviation "unit," he says at the end of his speech that he intends to create an air battalion of seven companies. Indefinite declarations are apparently not confined to the British Government.

The immediate result of this speech is that on February 14th the Secretary of State to the German Treasury proposed during the discussion on Army Estimates in the Reichstag to add £100,000 to the already large sum (£640,000) voted for aviation purposes in this year's budget.—W. E. de B. W.

Aviation in the Turco-Italian War.

Guiseppe Rossi, the volunteer aviator, who has recently been flying for the Italian Army in Tripoli, has written a letter from Tobruk to a friend in Paris describing his most exciting experience as an aerial scout, an experience that was briefly mentioned in these columns a week or two ago.

Early in the morning he flew on a Farman biplane, accompanied by Captain Montu, from the Italian camp near Tobruk towards the Turkish camp, thirty kilometres away, with the intention of experimenting with a new type of bomb. At about half this distance they flew over several parties of Arabs, who at once opened fire. Apparently Rossi was flying at a low altitude, for he says that had it not been for the presence of Captain Montu, he would have relinquished his project owing to the severe rifle fire. Instead, he gave the preliminary signal to Captain Montu to release a bomb. When about seven hundred feet above the first group of Arabs he made the second signal, and the bomb was released. He says nothing of the damage done, but was impressed at the sight of men, horses, and camels rushing in all directions in panic. To use his own words, "The spectacle was marvellous, but as the fusillade continued I was unable to enjoy it at my ease."

In order to return to the Italian lines he made a turn to the left, dropping considerably in the process. As he was crossing the left wing of the Arab forces a bullet struck Captain Montu in the thigh. Rossi was about to turn in his seat in order to see how badly Montu was hurt, when the engine stopped. One can imagine the pilot's feelings as he commenced a *vol plané* into a horde of untamed and annoyed Arabs. However, before he had descended two hundred feet the engine began to fire again, and all was well. The journey back to the Italian camp was made against a high wind, which lowered the speed considerably. Nevertheless, as the world knows, they reached their own lines in safety. It was found on examining the machine after the flight that several bullets had pierced the plane and one had broken away one of the wires holding the petrol tank in position. It will perhaps be a lesson to military aviators to fly at a higher altitude when over a hostile force, and also to use a fast, fully-powered machine.—W. E. de B. W.

Mr. Grahame-White's Return.

Mr. Claude Grahame-White returned from his long tour in America a few days ago and is now in London. He takes a very pessimistic view of the present state and immediate future of aviation in the United States. Flying exhibitions, as a paying business for English aviators, are practically dead. Many an American who can fly quite well is willing to do a week's flying for 100 dollars. Interest in flying seems extinct.

Mr. Grahame-White says that it is quite impossible to sell machines or engines in the States at any price. There is no market for aeroplanes in that country. He strongly deprecates sensational flying and says that people ought not to underestimate the dangers of ordinary flying, however careful the pilot may be. Further, he thinks that before anyone learns to fly an aeroplane he should go through a course of instruction in the building of machines. If a man does not know enough to realise when his machine is unfit to fly he ought not to possess a pilot's certificate.

The Mortimer Singer Prize.

On February 14th Lieut. Barrington-Kennett, Grenadier Guards, attached Air Battalion, made a flight of 242 miles over Salisbury Plain. He was accompanied as passenger by Corporal Ridd, R.E., in a 50-h.p. Nieuport two-seated monoplane, and was competing for the Mortimer Singer Prize.

It has been assumed by many that under the rules regulating this contest it is essential for the officer-pilot to be accompanied by a commissioned officer of his own Service, be it Army or Navy. The important part of the rule concerned actually reads as follows: "(1) The winner to be the officer who, accompanied by a passenger, also in the Regular Service," etc. It is therefore possible for an officer of either Service to take as passenger a soldier or sailor of any rank.

The Week's Work.

Monday, February 12th.

Brooklands.—At Bristol School Mr. Fleming up early with Lieuts. Carfrae and Smith. Mr. Smith then doing circuits and Mr. Carfrae straights. Mr. Fleming up with Capt. Raleigh. Latter then doing circuits and 8's, starting and landing notably well. Capt. Weeding went for altitude test, so winning his brevét. Lieut. Longcroft doing straights in good style. No one else out.

The Air Battalion.—Capt. Fulton out on Bristol, followed by Lieuts. Conner, Reynolds, and Barrington-Kennett, the latter also putting in a flight on the Nieuport.

The Plain.—Mr. Hotchkiss testing, Lieut. Harrison for passenger flight, afterwards making first solo. Mr. Bendall out, making complete circuits. Mr. Hotchkiss with Commander Schwann as passenger.

Tuesday, February 13th.

Brooklands.—Mr. Graham Gilmour on Martin-Handasyde testing new wings. Machine flying beautifully, and if anything faster than before.

At Vickers School Mr. Johnston and Knight out on *Vickers II*, and Capt. Wood on *Vickers III* going well.

At Avro School Mr. Sippe out on school Avro-Green, angle of planes recently altered, and machine gets up easily to 120 ft. in single circuit.

At Flanders School Mr. Lark rolling and Mr. Kemp flying circuits.

At Bristol School Capt. Allen doing circuits on biplane. Lieuts. Longcroft and Smith straights and later circuits. Lieut. Carfrae, making wonderful progress, doing circuits and 8's. Mr. Fleming then out on little monoplane, followed by Mr. Pizey. Mr. Nesham on biplane doing excellent 8's, and Mr. Lane straights. Mr. Merriam, the Cornish pilot, now flying excellently, took up Mr. Nesham as his first passenger. In afternoon Major Sir Alexander Bannerman, Commandant of Air Battalion, and Capt. Broke-Smith, Adjutant and Instructor, up for passenger flights with Messrs. Pizey and Fleming, both being allowed to take hold of control lever. So pleased with capability of pilots that Capt. Broke-Smith decided to join school as well as the Commandant, instead of going to Army camp on Salisbury Plain. This decision excellent score for Bristol School, so congratulations to firm who had perspicuity to send two such pilots as Messrs. Pizey and Fleming to Brooklands. Most excellent thing for any school if pilots can be friends of pupils as well as mere instructors, and success of Brooklands school directly due to personal charm of both pilots. But popularity alone no use without discipline and organisation, necessary qualities supplied in this case by senior pilot, Mr. Pizey. Not a smarter, more hard-working, more businesslike school in this or any other country, or one more prolific in results. To paraphrase old newspaper phrase, "A school run by gentlemen for gentlemen."

Eastchurch.—Mr. Travers and the Territorial pupils, Messrs. Meredith, Hedley and Cutler, were out, Mr. Cutler making very neat circuits, looks like being an excellent flyer.

Hendon.—At Blériot School all pupils good spell of work. In afternoon Mr. Parr passed for certificate at first attempt after trial flight on brevét machine. Landings *en vol plané* at conclusion of each half being particularly well judged. Mr. Allen, who has made rapid progress at school, then aloft and finished second half of tests, after being weather bound for six weeks, flying in excellent style and driving 30-h.p. Anzani as though it had been 50-h.p. Gnôme. Mr. Prenssiel soon after took out same machine and did several circuits in usual style, and is going for ticket. Mr. Pothet meanwhile putting good practice.

At Grahame-White School, Mr. Lewis Turner out with monoplane No. 4 instructing Mr. Ramsay in the controls; Mr. Biard making straights and circuits on biplane No. 3, and showing fine progress. In afternoon Mr. Ramsay again out rolling; Mr. Raphaite also rolling, and Messrs. Biard and Gates doing straights and circuits.

At Ewen School pupils put in considerable amount of practice, Messrs. Dubois, Baumann and Warren making splendid flights and now well on way for brevêt. During day Mr. Ewen made four flights on school Deperdussin, remaining in air each time about 20 mins., doing some tricky performances and always finishing with one of his long glides.

At A.S.L. School, Mr. Ridley-Prentice out on Green-Valkyrie for trial, terminating with effective glide in front of sheds. Immediately gave over machine to Mr. Busk, who put in excellent hour's work before dark. Mr. Busk showing marked progress, rising fully 60 ft. and landing in expert style. Finished up with fine half-circuit. Considering Mr. Busk can only attend once per week, he shows great aptitude and should shortly be flying circuits.

Windermere.—Mr. Oscar Gnosspelius on hydro-monoplane with 50-h.p. Clergét, doing short hops and getting control of machine nicely.

Wednesday, February 14th.

Brighton-Shoreham.—Collyer-England machine out with new propeller. Messrs. England and Dowland both putting in straights.

Brooklands.—At Percival School Mr. Percival tuning up biplane.

At Sopwith School Mr. Sopwith on Wright performing well and taking passengers. Other school machines rapidly being got ready in able hands of Mr. Sigrist.

At Bristol School Mr. Merriam, now promoted to "air tester," out for trial. Capt. Allen also testing air. Capt. Raleigh doing 8's in excellent style. Lieuts. Longcroft, Carfrae, and Smith all flying well, also Messrs. Lane and Nesham. Pizey up with Lieut. Rees, of Welch Regiment, as passenger. Capt. Allen

THE STORY AND ITS POINT.—Mr. Robert Loraine and Mr. T. O. M. Sopwith (left and right) having just descended on the dual-control Wright, Mr. Loraine tells his pilot one of his experiences.

out on monoplane for first time. Report that knees projected above *cabane* not strictly true. At first attempt chased own tail diligently, finally burst tyre. Later got into air, came down brusquely, and broke propeller owing to landing on spring "tusks" of chassis. Mr. Lane also rolling on monoplane. Messrs. Pizey and Fleming have now four pupils ready for brevét, a remarkably good showing considering weather up to date.

Eastchurch.—Lieut. Spencer Grey, R.N., arrived, thus completing second quartette of Naval officers gazetted to Eastchurch. He possesses his own Blackburn monoplane.

Hendon.—At Blériot School, Mr. Prenssiel out early doing circuits, Messrs. Allen, Pothet and Hall taking it in turns to do straights. In afternoon, M. Desoutter made first attempt for brêvet, which, after preliminary canter, he managed in perfect style, landing *en vol plané*, so that monoplane stopped few feet only from judges.

At Grahame-White School, Mr. Biard out early on biplane No. 3, making straights with good landings and afterwards completing three circuits in gusty wind; Mr. Lewis Turner also making circuits and Mr. Raphaite rolling.

At Ewen School, pupils out adding to their experience. Messrs. Baumann, Warren and Dubois had charge of Blériot in turn, latter making exceptionally steady flight.

The Air Battalion.—Capt. Fulton, Lieuts. Conner and Reynolds all out on biplanes. Lieut. Barrington-Kennett did a couple of short trips and decided to go for Mortimer Singer prize. Accomplished 258 miles in 4 hrs. 51 mins. with passenger (Corpl. Ridd). 242 miles of this will count for the prize. Start being 8 miles from sheds. Meanwhile all the other officers out on biplanes.

The Plain.—Mr. Hotchkiss and M. Jullerot up. Later Mr. Hotchkiss took up new machine just received from works at Filton. After having circled round an eye-bolt burst, and wire getting into way of propeller, smashed same, but fortunately Mr. Hotchkiss was able to come to earth without further damage. Commander Schwann for passenger flight with M. Jullerot, after which M. Jullerot up on Anzani monoplane. Lieut. Brodigan made three solos, Lieut. Harrison four solos. M. Jullerot took Commander Schwann for two tuition flights. Mr. Hotchkiss made good flight on school monoplane. Rose to 1,000 ft., and at this height rolled machine in most daring manner, and also made some very sharp right and left-hand turns, finishing up with a *vol plané* with engine completely cut off. [It is to be hoped that Mr. Hotchkiss will not play tricks on the monoplane yet awhile.—Ed.] Lieut. Wyness-Stuart and Lieut. Harrison and Mr. Bendall made solos. Lieut. Bear then passed second part of test for brêvet, observed by Lieut. Stuart.

Windermere.—Mr. Gnosspelius on hydro-monoplane now doing good long straight flights. Excellent performance, as neither machine, floats, nor pilot were used to flying, so only certain factor was engine.

Thursday, February 15th.

Brooklands.—Mr. Graham Gilmour again out testing new wings on Martin-Handasyde, and, as usual, flying beautifully.

At Vickers School Capt. Sykes and Capt. Wood doing straights on school machine, *Vickers II.* Mr. Johnston and MacDonald on same for circuits. Capt. Wood, and later Mr. Johnston, out on *Vickers III*, doing well.

At Percival School Mr. Percival flying well. Mr. Cannon rolling.

At Avro School Messrs. Sippe, Young and Setti all out on Avro-Green.

At Flanders School Mr. Kemp for circuits, followed by Messrs. Lark and Jacques rolling.

At Bristol School Capt. Raleigh and Lieut. Longcroft doing circuits. Capt. Allen making attempts on monoplane, and getting straight flights. Will do well before long, and would do better if machine fitted him. Would be well if aeroplane makers realise what motor-car makers have not discovered after fifteen years, that all drivers are not the same length, and arranged for adjustability accordingly.

Eastchurch.—Splendid morning for flying. Engineer Lieut. Randell, R.N., made his first *vol plané*, which, although possessing inevitable little defects of beginners, was extremely well managed. Capt. Gerrard, R.M.L.I., out constantly during morning, and took up as passengers on *Short No. 34* Captain Creagh Osborne, R.N. (Director of Compasses) and Mr. Borton.

Hendon.—At Bleriot School, Messrs. Pothet and Morris each managed to steal time to put in straight line practice.

At Grahame-White School, climatic conditions unfavourable, theoretical work only.

At Ewen School, pupils spent day in hangar assisting in thoroughly overhauling Blériot.

Friday, February 16th.

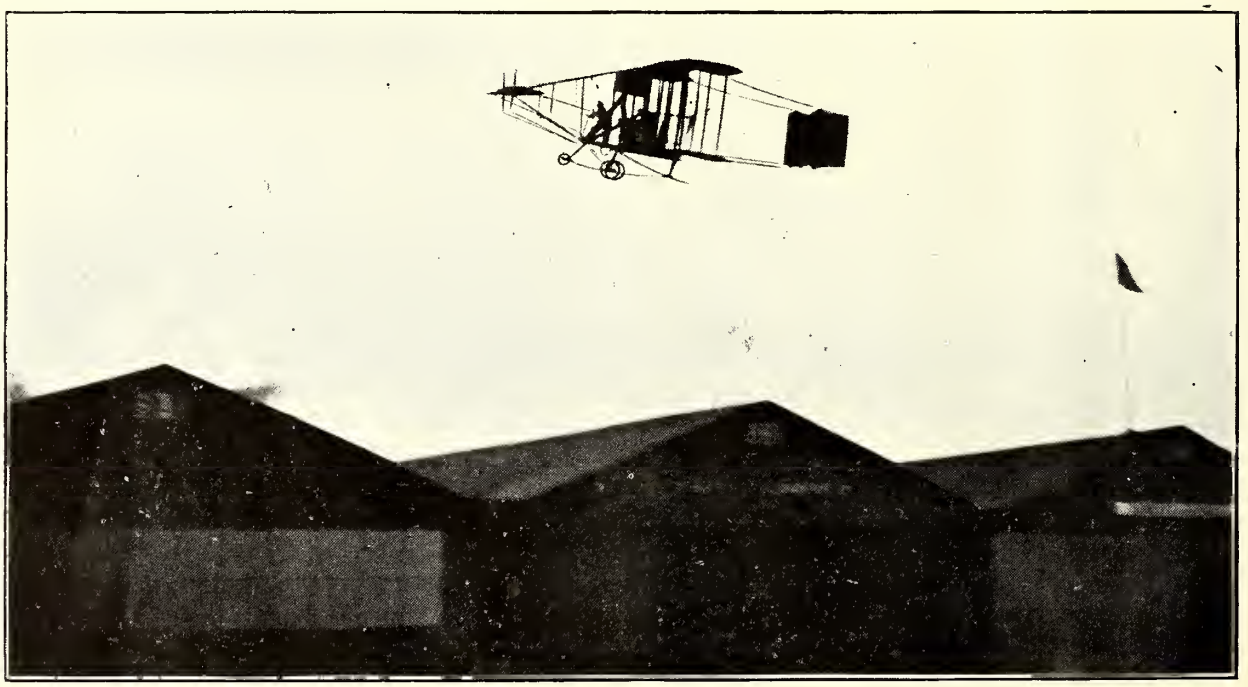
Brooklands.—Mr. Graham Gilmour again out testing on Martin-Handasyde, manœuvring perfectly. Machine lifting excellently with new wings.

At Vickers School Capt. Sykes and Capt. Wood doing straights on *Vickers II*, and Mr. Johnston a circuit.

At Deperdussin School Mr. Gill suddenly improved and started doing strong straight flights on taxi. Lieut. Porte, R.N., out testing other taxi, now with A.B.C. engine, which apparently shapes well.

At Avro School Messrs. Sippe, Setti, and Young going strong.

At Percival School Mr. Percival getting better results from E.N.V.



Mr. Cody over the Howard Flanders shed on Sunday, after missing the Blondeau-Hewlett flagstaff by inches.

At Bristol School Mr. Merriam up testing air. Lieut. Smith started for brevêt, but slight *rencontre* between wire and propeller stopped him. No damage done. Later Capt. Raleigh for brevêt also, but stopped by wind. Mr. Fleming up giving tuition to Capt. Raleigh and Mr. Lane. Lieut. Longcroft doing circuits.

Brighton-Shoreham.—Mr. England again up, and Mr. Dowland doing straight flights, but buckled wheel. Lieut. Lawrence's Blackburn nearly ready again.

Eastbourne.—Gassler doing straight flights at Fowler School.

Eastchurch. — Commander Samson, R.N., flying the "Birdling" during day, whilst Capt. Gordon, R.M.L.I., made fine flights on *Short No. 34* over 1,000 ft., where he found air nice and steady, although puffy on ground.

Hendon.—At Blériot School, pupils at "inside-the-sheds" work only.

At Grahame-White School, theory only.

At Ewen School, pupils out with Blériot, getting engine tuned up.

The Air Battalion.—Nothing doing except trial flight or two by Capt. Fulton.

Saturday, February 17th.

Brooklands.—At Avro School Messrs. Sippe, Setti, and Young doing well. Mr. Setti quite suddenly, after months of rather doubtful straights, caught hold of machine and started doing circuits in fine style, but rather too sharply. Mr. Young doing half turn in good fashion.

At Deperdussin School Mr. Gill doing straights full length of ground on taxi for 1½ hours. Mr. "Partridge" ditto on other taxi for ¾ hour.

At Vickers School Mr. MacDonald doing circuits on *Vickers II.*

At Flanders School Mr. Kemp tuning up, and Mr. Jacques and Mr. Lark rolling.

At Bristol School, after machines got ready in sheds, Mr. Merriam out to test air, and had just come down when news arrived of Mr. Gilmour's death. During morning Mr. Cody had arrived, intending to fly to Hendon, and arranged to meet Mr. Gilmour there, and was just getting ready to start when the evil news came.

All sheds promptly shut, no one having the heart to fly, Mr. Gilmour being loved and respected by everyone at Brooklands.

Brighton-Shoreham.—Blackburn monoplane repairs completed. Lieut. Lawrence made trial flight of three miles in morning, and in afternoon visited Brighton. First time Blackburn has been seen at that town, and first time advertising has been carried out there by dropping hand-bills from an aeroplane as Lieut. Lawrence did as he passed over the Front. Altitude of 1,500 ft. maintained during the greater part of trip, which lasted 22 mins. and terminated with a splendid *vol plané*.

Eastbourne.—Mr. Fowler made two flights of 12 mins. each, flying over Pevensey Castle, about 7 miles away. The Mayor of Eastbourne was among visitors.

Eastchurch.—Lieut. Longmore, R.N., flew Short tractor biplane with Lieut. Spencer Grey, R.N., as a passenger. Latter much impressed with speed and stability. All aviators to-day complained of "bumpy" atmospheric conditions which set in during afternoon, although day had opened well, several receiving severe buffeting whilst flying. Lieut. Spencer Grey's Blackburn monoplane erected to-day, Mr. Blackburn, Jun., himself being present, working all night with usual North-country love of work. Mr. Grey, who is keen to be flying again, should be able to do so by Monday if day is suitable.

Hendon.—At Blériot School, M. Salmet put in active instruction and school machines were brought out, but wind too strong till about 3.30, when Messrs. Pothet and Morris confined themselves to straights, during which time Mr. Prenssiel flew circuits. In early evening M. Desoutter concluded certificate tests, landing beautifully, making third pupil at Blériot School to obtain brevêt during week.

At Grahame-White School, pupils present in full force, putting in good day's work; Mr. Lewis Turner out early making test flight on biplane No. 1, found engine running badly, so turned it over to engineers for overhauling, and had biplane No. 3 brought out, Mr. Biard taking pilot's seat and making several good flights during morning and afternoon. Mr. Ramsay practising rolling on monoplane No. 4, and Mr. Gates and Mr. Fowler perfecting straights.

At Ewen School, big day's work was put in, pupils being out from early morning till dark. Mr. E. H. Lawford, notwithstanding practice confined to week-ends, continued to make good straights. Messrs. Baumann and Dubois, each trying to surpass other, exhibiting remarkable aptitude and both making beautiful steady flights at 30 ft. Mr. Warren finished school work for day by flying the "Blériot" back to hangar. In morning, Mr. Ewen did some sensational flying on 28 h.p. Deperdussin, at times flying completely out of sight. He found air very unpleasant, and once over railway bank he was forced to dive 200 ft. During day Mr. Denys Ware, new pupil, joined school and had first instruction in controls.

At A.S.L. School, Mr. Hawker practising on Green-Valkyrie during afternoon. Made good flights length of aerodrome, showing good control.

The Air Battalion.—Capt. Fulton, Lieuts. Reynolds and Barrington-Kennett scouting practice on Bristols. Lieut. Hynes ditto on Bréguet. Capt. Loraine, of Grenadier Guards, made his début on biplane, flying Bristol splendidly first time. In afternoon, Capt. Fulton, Lieut. Barrington-Kennett doing series of flights with passengers. Lieut Hynes up for one hour's trip on Bréguet. Capt. Loraine having second trial of biplane, flying as if he had been on it always, finishing with splendid glide from 400 ft.

The Plain.—M. Jullerot ascended, Lieut. Brodigan and Lieut. Harrison flying. Lieut. Wyness-Stuart and Mr. Bendall for solos. Captain Gilbert de Winckels, flying "Bristol" monoplane for second time, met with unfortunate accident, sustaining serious injuries. When he regained consciousness he told Colonel Bagnine, of Italian Embassy, that at 300 ft. he attempted sharp right-hand turn, and then pushed lever far over to right his machine, after which he says he cannot remember anything, having become seized with giddiness. Machine planed steeply down towards earth at great pace, engine running full. In further conversation he attaches no blame to the "Bristol" monoplane, which was in perfect order, but accounts for accident by fact of having lost his head. Great hopes are held out of his speedy recovery. He, it may be added, is an enthusiastic aviator, and a man of proved ability. [It should be noted that this report is given by the British and Colonial Aeroplane Company's office at Filton.—Ed.]

Sunday, February 18th.

Brooklands.—Despite nasty wind midday, much flying. Mr. Percival first out, and flying past midday, when wind really bad. New *Parseval* apparently marvellously stable.

At Flanders School Mr. Kemp out early and late, machine flying beautifully, and apparently with plenty of lift. Mr. Manning rolling and making short straights.

At Spencer School Mr. Herbert Spencer flying well with passengers.

At Sopwith School, Mr. Sopwith on scene early in afternoon, and despite wind hard at it with passengers on Wright nearly all day, among them being Capt. Sykes, of War Office, who was delighted with handling of machine; also Messrs. Fisher and Raynham.

At Bristol School Mr. Fleming up high, flying excellently. Capts. Raleigh and Allen, Lieuts. Longcroft and Smith, and Messrs. Nesham and Merriam all up.

At Avro School Messrs. Setti and Young out, Mr. Setti just missing hitting Mr. Sopwith's Wright when latter was starting, owing to crowd encumbering ground and preventing pilot of Wright seeing other machine approaching. Now crowds increasing again, official control of ground badly needed if accidents to be avoided.

Towards dusk Mr. Cody brought out "*Cathedral*," and proceeded to do astounding things with it, handling the enormous machine as if it had been Mr. Sopwith's little Wright, but at about twice the speed. At one time very nearly a collision between the two, but cleverly saved on both sides. After various evolutions he took up Messrs. Charteris and Howard Flanders as passengers, putting both on same side of machine to balance propeller torque, and flew off to Farnborough with them.

Eastchurch.—Lieut. Cockerell, of Territorials, put in excellent practice. Mr. Travers out early with Messrs. Meredith and Hedley on Short dual control machine. Mr. Cutler made good flights and is ready for certificate.

Hendon.—With ground to themselves, W. H. Ewen's pupils put in full day's practice. Mr. Lawford made several good straights, while Messrs. Dubois and Baumann got in some fine turning work.

The Air Battalion.—Lieut. Barrington-Kennett out on Bristol. Lieut. Reynolds trying engine of new Bristol monoplane. Capt. Loraine and Lieut. Conner taking turns at Blériot two-seater. In afternoon, Capt. Loraine passenger carrying on Bristol biplane, so everyone followed suit, and all officers were soon busy carrying passengers, keeping it up till almost dark, last one (Lieut. Reynolds and Corpl. Vagg) finishing in twilight.

Aviation at Reasonable Cost.

The average man who would like to fly is deterred from doing so not from fear of accidents but because he has an idea that he has to pay £1,000 for a machine, £2 to £3 a week for a shed, £10 a week or so for a staff of workmen, and as much as he has left out of his income for repairs and general running expenses. The writer has long been of the opinion that if some co-operative scheme could be evolved it would be easy to buy a machine for £300 to £400, and do all one's flying for another £2 to £4 per week, provided one was careful and did not break the machine up very badly.

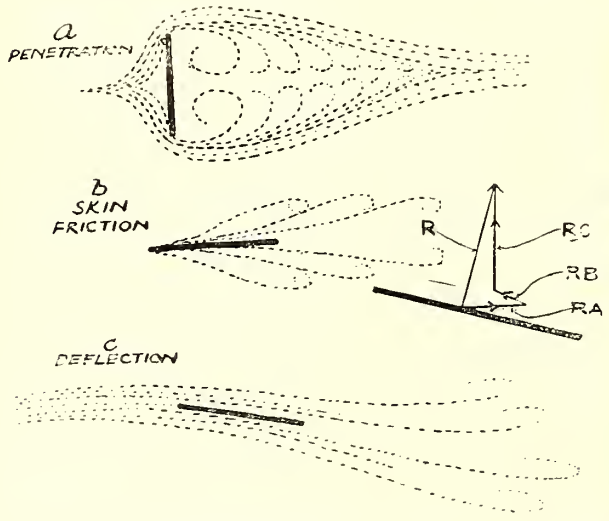
It is therefore satisfactory to note that a very similar idea has been put into concrete form by that eminently up-to-date firm, the British Deperdussin Co., Ltd., who are now prepared to take a lump sum down, and for that to supply a machine, give tuition up to the time of taking the pilot's certificate, give accommodation to the machine, see to its upkeep, assure that the engine is always in running order, supply mechanics to look after it, and generally superintend things, so that the purchaser is absolutely certain not to exceed a certain specific and quite moderate sum for his season's flying. As a matter of fact, the whole thing can be done for a sum of little more than half what one paid for a machine alone last year, and, be it noted, the aviator gets a better machine now than he did then, and has at the end of the year a second-hand machine which is worth more than a machine of last year would have been at the end of its year.

It has always seemed wonderful that so many young men should be forthcoming who were not only willing to take the risks of the pioneer, which have to be taken in every new science, and who were at the same time able to afford to spend thousands a year on their hobby. Under the new system, however, the sport of flying becomes, at last, a business proposition, in which any sportsman can take part who can afford to hunt or run a car.

The "inclusive terms" idea is not only a clever move on the part of Messrs. Santoni and Porte, the chiefs of the British Deperdussin firm; it is a very real step forward in the development of the sporting side of aviation.

Aviation Science.

Mr. A. R. Low, chief designer of Vickers, Ltd. (Aviation Department), continued his series of interesting lectures at the London University last week.



In the second lecture he said that the reaction on a surface by a relative current of air is accompanied by three classes of eddies, as above, *a*, *b*, *c*.

The reaction may therefore be represented as the sum of three vectors, R*a*, R*b*, R*c*. The total reaction only, can be directly measured.

As remarked in the opening lecture, Eiffel's results are accepted generally by designers, though his method is open to grave doubts.

Pénaud's classical form of empirical equation was discussed, and it was shown that it anticipates very fairly the general run of modern experimental work.

In the third lecture Eiffel's results were compared with Riabouchinsky's, and the controversy between these two experimenters in the *Technique Aéronautique* was quoted. The lecturer declared his adherence to the Riabouchinsky method, and showed how to make corrections for Eiffel's results from Riabouchinsky's figures (*Technique Aéronautique*, December 15th, 1910, and January 15th, 1911). These bring back the empirical equations applicable to experimental results to general form :—

$$Y = k \frac{d}{g} (l + a) S V^2$$

$$X = m k \frac{d}{g} (l^2 + b^2) S V^2$$

In Pénaud's form $a = 0$, $m = 1$. In general $m = .5$ to $.8$, and a is of the same order as b^2.

A Nieuport machine was calculated in detail, and the aggregate result compared with Eiffel's experiments on a 1/10 scale model.

The Royal Aero Club.

The Annual General Meeting will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W. Thursday, February 29th, 1912, is the last day for the receipt of notices of motion.

At the meeting of the Committee on Tuesday, the 13th inst., the following new members were elected: Charles Ferris Montagu Chambers, John Clutton, Capt. Rowland Routledge Gibson, Diodata Giordani, M.D., Ronald Hargrave Kershaw, Commander F. Scarlett, R.N., and Mrs. Cheridah Annie de Beauvoir Stocks.

The following Aviators' Certificates were granted :—(181) Eng. Lieut. Charles Russell Jekyl Randall, R.N. (Short biplane, Eastchurch); (182) Capt. Thomas Weeding (Bristol biplane, Brooklands).

The report of the National Physical Laboratory on the sealed barograph used by Mr. H. Salmet at the Hendon Aerodrome on Tuesday, November 28th, 1911, was received and it was resolved to accept the height of 8,070 ft. as a British height record. Mr. Salmet established this record on a 50-h.p. Blériot.

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NOTHING TOO BIG.
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MISCELLANEOUS ADVERTISEMENTS

All Advertisements for this column should arrive at this office by 6 p.m. Monday, to ensure insertion.

For the convenience of Advertisers, replies can be received at the office of The Aeroplane.

Special PREPAID Rate—18 words **1/6**; Situations Wanted ONLY—18 words **1/-**. 1d. per word after.

COMMONWEALTH OF AUSTRALIA.

Applications are invited from British subjects for two expert mechanists and aviators to the Commonwealth Department of Defence, with salary of £400 per annum each, including all allowances except travelling.

Applications should set out the nature of qualifications and experience, including military experience, if any, whether born or domiciled in Australia, age, whether married or single.

No responsibility accepted for accidents.

Successful candidates will be appointed for 12 months probation, on conclusion of which, if satisfactory, appointments may be confirmed.

Applications, accompanied by testimonials, will be received up to March 1st, 1912, and should be addressed to The Official Secretary, Commonwealth of Australia, 72, Victoria Street, S.W.

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HOWARD WRIGHT MONOPLANE, nearly new. Price £300, less engine £150. Nearly New.—8, George's Road, Holloway Road.

FOR SALE.—Howard Wright Biplane. Latest type, new condition. Flies admirably, with or without passenger. Price with 50 h.p. Gnôme engine £400. Without engine £150. Immediate delivery London. Wire or write "L," 51A, Conduit Street, W.

28 H.P. MERCEDES Double Landaulette, upholstered in Bedford cloth, fitted with covers, in first-class running order, complete, with spares, lamps and accessories. Any trial run. Exchange for Gnôme engine or aeroplane.—Box No. 424, The Aeroplane, 166, Piccadilly, W.

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PROPELLERS made to any design at trade prices. Work guaranteed.—Apply, R. P. Miller and Co., 13, Greek Street, W.

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THE SOPWITH AVIATION SCHOOL has the greatest variety of machines of any school in Great Britain. Tuition on Howard Wright or American-Wright Biplanes, with dual control, Blériot or Howard Wright Monoplanes. FOUR DISTINCT TYPES.—Particulars from the Sopwith Aviation School, Brooklands, Weybridge.

A.S.L. SCHOOL OF AERONAUTICS. Tuition in all branches of aeronautic engineering; remunerative scholarships to pupils attaining certain standard of efficiency.

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£50 includes expert tuition on both Blériot and Deperdussin Monoplanes for R.Ae.C. certificate, and insurance against breakage. This offer is open to a limited number of pupils only. Write now for particulars and agreement form to W. H. Ewen, Aerodrome, Hendon, N.W.

HERBERT SPENCER FLYING SCHOOL, Brooklands Aerodrome, Weybridge. Tuition and practical constructional work from £40. Passenger flights from £2 2s.

TUITION on Percival Biplane at reduced fees during the winter months. Every facility for sound and rapid instruction. Terms from £30. For particulars apply to The Aero Construction Co., Brooklands Aerodrome, Weybridge.

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Tuition on Monoplanes and Biplanes till Brevet is obtained.
£45 INCLUDING INSURANCE AGAINST BREAKAGES. Magnificent Aerodrome. Competent Instructors.
£5 PRIZE to pupils accomplishing 30 minutes' flight within a week of passing for certificate.
Write for full particulars, Secretary, Scottish Aviation Company, Limited, 65, Bath Street, Glasgow, or at Barrhead, N.B.

DEPERDUSSIN Aviation School at Brooklands; thorough instruction in flying by competent staff; thorough tuition £75, including breakages and third party insurance.—Apply to The British Deperdussin Aeroplane Syndicate, Ltd., 30, Regent Street, Piccadilly Circus, S.W., or at Brooklands.

FILEY AERODROME.—Tuition on Blackburn or Blériot Monoplane. For particulars apply Blackburn Aeroplane Co., Leeds.

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WANTED, to purchase, detailed working drawings of a proved Monoplane. Suitable engine drawings also considered.—Box 420, The Aeroplane, 166, Piccadilly.

ONE EIGHT Cylinder Gibaud Magneto in perfect working order; original cost 16 guineas, take £5 10s. —Rowell, Ship Street Gardens, Brighton.

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Useful Model Work.

MODEL PLANES.

Planes for models are many and various in their type and quality. Many of these, however, will be instantly ruled out by our particular requirements. Since our model-flying is to be of the nature of a serious enquiry into the effects of alterations of the various components of an aeroplane, we must, among other things, have planes whose camber is exact and constant.

So far as I know, there are only three ways of achieving this. I have tried them all and find very little choice between them. The plane can be built entirely of steel wire; it can be built with steel wire or wooden spars and ribs of sheet tin, or it can be made double-surfaced, with built-up ribs as in a full-sized machine.

The first is the least fragile, and keeps its camber best; it is, however, the most difficult to true up in the beginning. The second is easier to make, but the camber does not always keep true after heavy landings; but it has the great advantage that it can be warped instantly and easily, so as to correct any faulty assembling of the machine. The third, though easy to achieve somehow, requires neat fingers to do really well; but when well done, the result is very strong and light, and also looks extremely well.

The first method is fairly well known by now, but it will be as well, if only for completeness' sake, to describe its execution. The first thing to do is to make the "jigs" required. Two of these are necessary: one for the whole plane and one for the ribs (if the plane is to be tapered, there must be a jig for each size of rib).

The latter is shown in Fig. 1. It consists of two pieces of wood screwed together. One piece, A, is cut out with a fret-saw, the top being carefully shaped to the required camber. It is then screwed to the second piece, which should be larger. A hole, B, is drilled through exactly at the end of the curved top, just large enough to take the wire to be used. At the other end of the camber, C, the jig is carefully planed square.

To make the rib, a piece of wire is cut off to the proper length (about an inch longer than the chord of the plane), and three-eighths of an inch at one end is bent at right angles. This is inserted in the hole B, and then the wire is bent, with fingers or pliers, till it lies cleanly along the camber which was cut out. It must also be observed from above, to see that it lies touching the back piece of wood—this is to ensure that it is straight in plan view. When it is true both ways, it is bent over at C for fixing to the rear edge of the frame.

The jig for assembling the plane consists simply in a piece of board (about $\frac{3}{8}$ in. thick at least) planed clean on one side. On this side the plan-form of the plane is drawn out as accurately as possible, with the ribs also marked in. This is shown in Fig 2. A supply of small screws ($\frac{1}{2}$ in. No. 2 for choice) is necessary. Two of these must be screwed half in at the centres of the front and back edges; they must be placed just *outside* the line, so that the wire, inside them, will be upon the line.

A piece of wire must now be cut, about an inch longer than the perimeter of the plane. *Make no attempt to straighten the wire*, but solder together its two ends, so that it forms a ring. Squeeze this together in the middle, so that it goes between the two screws A and B, the join being at A. It will take up the shape shown by the dotted line. Now, compress the ends, by screws at C, so that the tips are of the right shape. It will probably be found that there is an inward curvature between the first screws and the point C. Further screws must be inserted, *inside* the line this time, to hold the wire true. We will suppose that the screws, D, are sufficient to hold the plane true. It is important that wherever screws are found necessary, a rib should be placed, so that it is best to make this jig and try it before settling on the position of the ribs.

When the ribs are all ready, they must be put in place, and fixed with a touch of solder. Then the plane is removed from the jig, and each rib bound to the edges with about eight turns of tinned flower-wire. They are then carefully soldered, taking care that the solder runs properly, and joins wire and binding. The plane is then complete, ready for covering.

If it is desired to have a "flexible trailing edge," the ribs are made as in Fig. 3, which show one tip of a plane so designed. In this case, the jig must be cut close to the "rear spar," as shown by the dotted line, so as to allow room for the trailing portion of the ribs. The ribs should pass *above* the rear spar. When the plane is removed from the jig, a length of fine steel tie-wire should be run along the tips of the trailing ribs, being secured to each one by a turn and a touch of solder.

The gauge of wire to be used varies with the size of the plane. I recommend 24 SWG for planes up to 8 in. span, 18 SWG for 2 ft. span, and 14 SWG for 3 ft.; intermediate gauges for sizes between.

MODEL CORRESPONDENCE.

Sir,—I recently tested a model monoplane fitted with skates. It easily rose from ice with only the same amount of elastic as I use when no landing gear is fitted, but of course will be better with a little more elastic. As it is at present the ratio of the weight of elastic to the total weight is as 1 to 5, which I think shows great efficiency. I should be very interested to know if this performance constitutes a record.

Sudbury. Montague L. Rolfe.

Sir,—Although I hoped my last letter was to be the final one on the subject of alleged 100-secs. duration, I cannot let Mr. Grimmer's insinuation pass without comment. Mr. Grimmer still says that it took me several months to find out that it was not a "Mann" machine I used. I quite forgot that (in Mr. Grimmer's eyes) all monoplanes with a triangular frame and two propellers were "Manns"; but in order that there can be no further doubt about the matter, I am sending you a photo of competitors taken just before the competition on September 16th last, which plainly shows me holding the machine I used.

I will enumerate a few of the differences: Length, 3 ft., and so constructed that no straining wire and strainers are required to hold it together, itself a great improvement; main plane, 22 in. by 5 in.; propellers, $10\frac{1}{2}$ in. diameter. The shape of the main plane is after the Blériot shape, and Mr. Mann's is copied from the Morane.

It is a remarkable thing that I, who constructed a model on September 15th to my own designs, should not notice its difference to the "Mann" until December, as Mr. Grimmer says. How does he explain away the photo? And since Mr. Grimmer so recently published a photo of the actual machine used, I will ask him how and when he got the machine to photo, since it has never left my keeping; and I challenge him to prove that the photo he published was *not* taken about the end of December, and that the machine in that photo was *not* one he had just made, because Mr. Grimmer has never seen the machine I used, and so he had no idea of its design, except what I verbally told him in the beginning of November.

If anyone cares for further evidence I have plenty more, also some other dealing with the duration, which I shall be pleased to send them if they write to me. Willis Bros., Hastings, will find me.

Hastings. H. Willis.

[Both sides having had ample opportunities of arguing, this altercation must now cease.—Ed.]

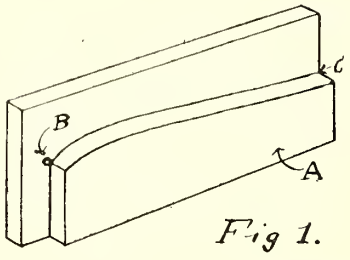


Fig 1.

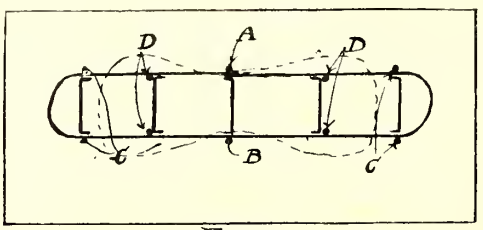


Fig 2.

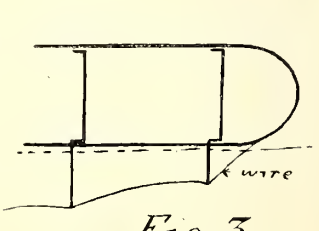
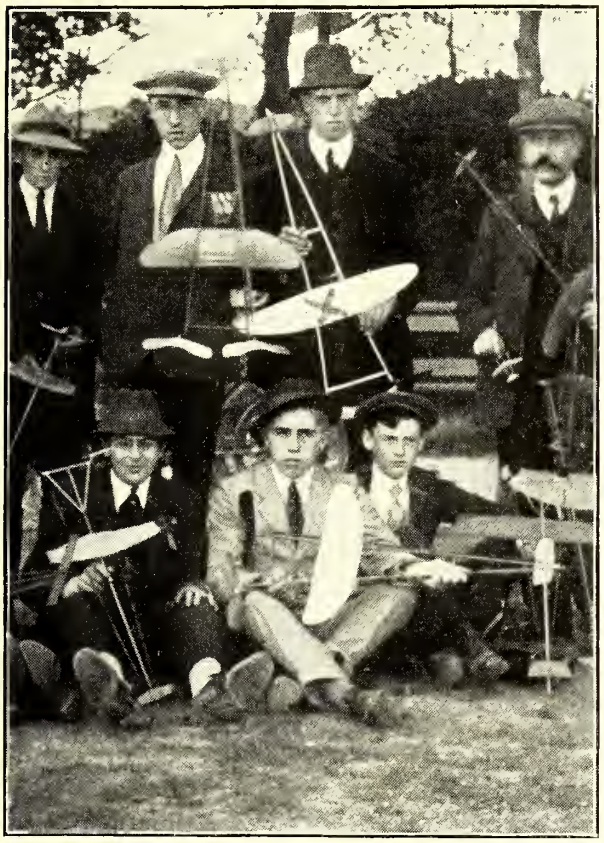


Fig 3.

Methods of Construction devised by Mr. P. K. Turner.



The "Duration" Dispute. Mr. H. Willis is shown with the machine he flew marked "X." Below is a competitor with a "Mann" machine.

CLUB NOTICES.

N.B.—Club Notes must be posted to 166, Piccadilly, to arrive not later than first post Monday morning, and should be as brief as possible.

Aero Models Association (N. Branch).—Good flying by Corder, Ross, Greene, etc., Finchley, Saturday last. Open competition for duration at Viver's Farm, Bishop's Avenue, East Finchley, N., Saturday, March 2nd, at 3 p.m. Entrance fee 3d. each model shared for 1st, 2nd and 3rd prizes. Messrs. Mann and Grimmer have presented sets of parts for competition in Distance event. Particulars later. Flying every Saturday at Finchley.—Malcolm B. Ross, Sec., 13, Highgate Avenue, N.

Blackheath Aero Club.—Saturday, at Kidbrooke, Messrs. Pizey, Holland, Richards, L. B. Morris, Egelstaff, Collins and Jarvis doing well. Mr. A. B. Clark got minute duration new "A" frame monoplane, and 48 sec. with 2¼ oz. "Victor" model. At Lee Aerodrome, Messrs. F. Plummer, L. Brough, F. G. Peter, H. H. Pizey, F. M. Bailey flying. Others at Blackheath and Crofton Park. Committee announce Messrs. Weston, Hurlin and Co.'s gift of half guinea "W. H. C." monoplane as prize for Juniors' "Duration" Competition. Details shortly. Saturday next, general meeting, 6 p.m., Central Hall, Peckham. Members proposing to participate in "P. K. T." efficiency contest apply to Secretary for entry forms. Committee would like all senior members compete event. Details of membership from Asst. Hon. Sec., L. Brough, 12, Manor Road, Brockley.

Birmingham Aero Club.—Flights Saturday by Mr. M. Vale, E. Trykle, W. Lunn, and Master Stamps. G. Wilde flying tractor model. E. Trykle got model to glide 48 yards down gliding hill.—G. Haddon Wood, Joint Hon. Sec., 8, Frederick Street, Edgbaston.

Brighton and District Aero Model Club.—General meeting to-night (Thursday, 22nd), at 8. Flying at Shoreham next Saturday. Communications, Hon. Sec., A. von Wichman, "Kingsleigh," Kingsway, Hove.

Bristol Model Flying.—Thursday, 15th, interesting lecture by Mr. W. G. Aston on "Automatic Stability." Meeting Saturday; best flights by Mr. Vessey's twin-screw cylindrical flier (200 yards). "Efficiency" contests shortly. Meeting at Sea Walls, February 24th, at 3 p.m.—R. V. Tivy, 3, Royal York Crescent, Clifton, Bristol.

Stoke Newington.—Saturday, longest flight, 1,500 ft., P. Gittas; duration, 52 secs., Mr. Macbernie. Club soon have workshop and full-sized work commenced. Provision for private experimenting separated from sporting.—B. H. Longstaffe, Hon. Sec.

Dover and District Model Aero Club.—Meeting, Saturday, February 17th. Messrs. Davis, E. N. Joyce, H. E. Whorwell, H. T. Holman, R. C. Wilson, and J. Clark flew well. New members welcome at meetings on Wednesdays and Saturdays at Northfall Meadow, behind castle.—R. C. Wilson, Asst. Hon. Sec.

Ealing and District Aero Club.—Meeting, 17th. L. Kirchner, G. Beeching, and C. Roche made good flights. L. Roche two consecutive flights 847 ft. and 1,030 ft. On Sunday, Beeching's model, 584 ft.—B. J. Kirchner, Hon. Sec.

Reigate, Redhill and District Aero Club.—Seven machines out Saturday. Messrs. Lewis, May, Wilson and Morris doing well. Competition, Earlswood ground, Saturday week.—Hal. V. May, Hon. Sec., 4, London Road, Reigate.

The Paddington and Districts Aero Club.—V. E. Johnson, Esq., M.A., now president of club. New members: Mr. C. Davies, of Twining's, and Mr. A. Wheeler. Mr. Davies offered first prize and Mr. Hurlin 2nd prize, improvements or inventions to increase efficiency, power or rubber driven, during year. Competition closes December 31st. Mr. Levy first in the field with plane of unique design. Mr. Cannell registers three-bladed propeller, and Mr. Evans four-bladed propeller. Messrs. Weston, Carter, Woolley, Davidson, Holden and Evans flying Saturday. In evening judging of workshop competition. Flying at Parkside Saturday, February 24th, 3.30 to 5 p.m. Cannell, Canning, Carter, Rasmusson and Woolley to compete. Monthly meetings altered to first Saturday in month instead of first Wednesday. Mr. Canning's lecture March 2nd. Members please note. Competition for beginners under consideration.—Sec., W. Evans, 133, Buchanan Gardens, Harlesden.

Nottingham Model Aero Club.—Lack of support forces committee to discontinue workshop in Central Avenue. Meeting, Forest Road Café, March 5th, 8 p.m., to discuss future of club. Those interested kindly note.—D. E. Barclay, Hon. Sec.

MODEL ADVERTISEMENTS.

"M.S.C." MONOPLANE. Parcel of materials containing wood, wire, fabric, rubber, finished propeller and drawings for making a splendid duration model, 30 in. by 24 in., 2s. 3d.—Murray, Stanger and Co., 20, Brograve Road, Tottenham, N.

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EVERY customer ordering a set of "Mann" parts between Feb. 24th and March 2nd, inclusive, will receive gratis a pair of finished "Mann" Propellers, exactly as listed at 3s. 6d. We returned 7s. 6d. last week to Mr. V. H. Rubin, 60, Elsworthy Road, South Hampstead.

RACING MACHINES, 18s.; Parts, 7s. 6d.; Propellers, 3s. 6d.; Instructions and Scale Drawings, 2s.; Rubber, 1s. 6d. per dozen; Lubricant, 1s. 3d.; everything post free by return of post from Mann and Grimmer, 15, Arlington Road, Surbiton.

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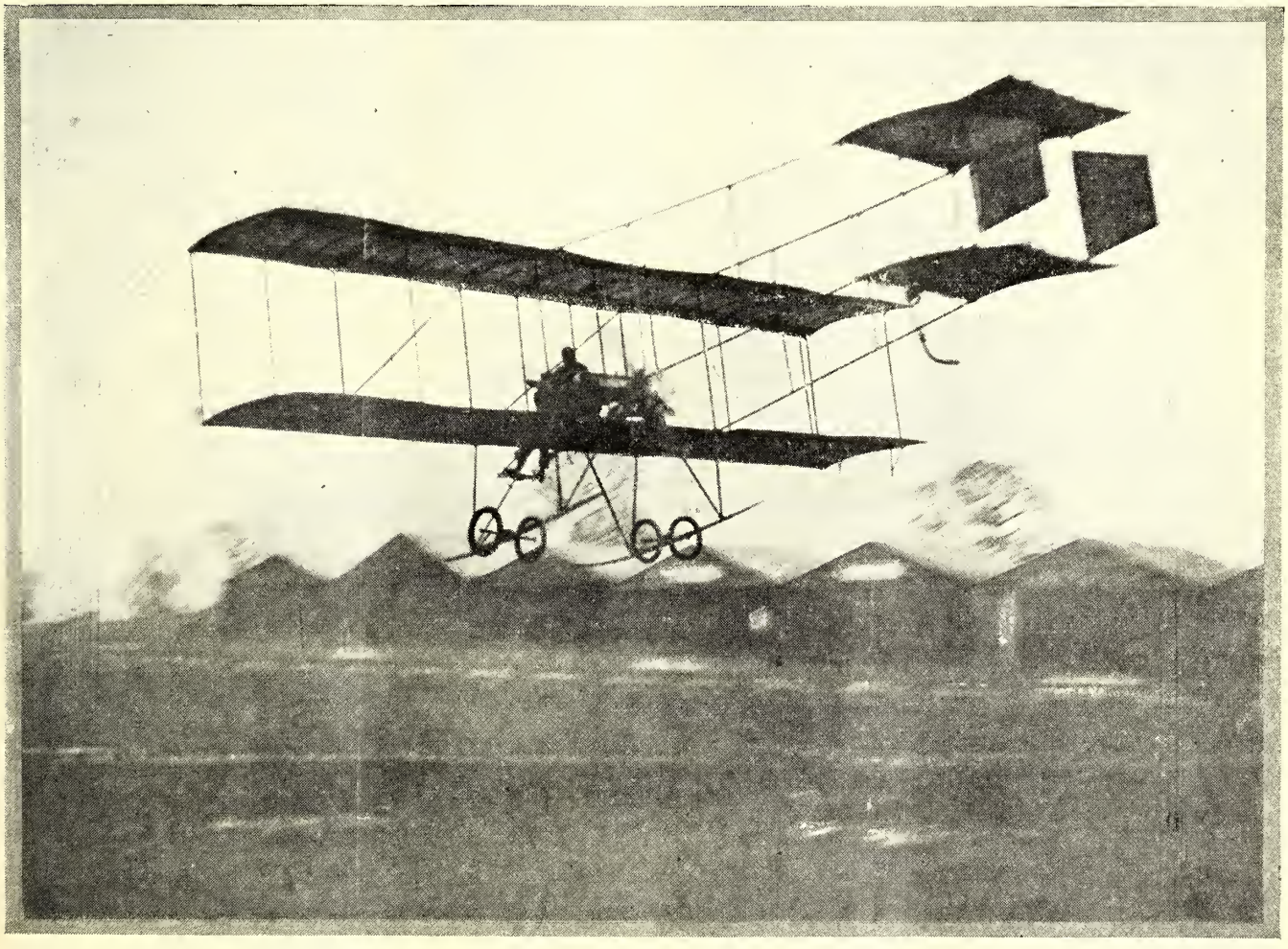
THE AEROPLANE

1D WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

VOL. II. [Registered at the G.P.O. as a Newspaper.] THURSDAY, FEBRUARY 29, 1912. No. 39.

HOME AGAIN.



Mr. Claude Grahame-White, back from the United States a week or so ago, made his re-appearance as an aviator at Hendon on Saturday last. He is here shown landing from his first flight with a passenger since his return.

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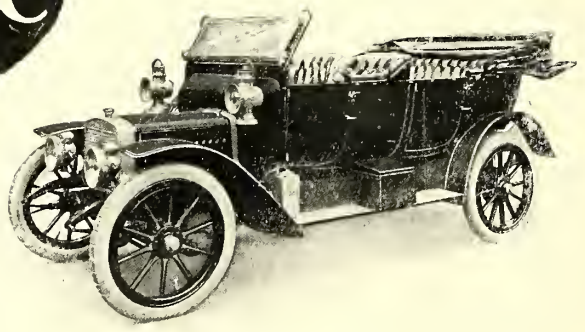

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MATTERS OF MOMENT.

UNEXPLAINED ACCIDENTS.

As might have been expected, poor Mr. Gilmour's fatal accident has called forth from the ignorant public an outcry that aviation should be stopped, that aeroplanes can never become safe, that all aviators must be mad, and so forth. There is, however, no need for those who are sincere believers in the future of aviation to feel any panic over such an accident as this. It is the kind of accident which one must always expect in any new science. We know a wing broke, but we do not know how or why it broke.

In the same way, unexplained accidents happened in the early days of railways, of steamboats, of motor cars, and even of passenger lifts, and one may assume that equally unexplained accidents happened when men first ventured upon the waters in dug-out canoes. Still, man has continued obstinately to practise all these modes of locomotion, despite the knowledge that if he confined himself strictly to his own feet on solid ground he would certainly escape death from any of these causes. It is probable, however, that even so a certain number of people preordained to that end would trip over stones on the road and die from fractured skulls; bruise themselves against trees, and die of blood-poisoning, or otherwise meet their death accidentally instead of dying of old age.

It is, of course, necessary that every proper care should be taken to safeguard human life, but human life alone is not so important as the progress of humanity, and those who cry out against the development of the aeroplane seem to forget that in its lies, first of all, the most terrible weapon of war yet evolved by the human mind, and ultimately the great bringer of peace to the world, for the aeroplane makes frontiers mere foolishness, annihilates distance, and brings distant peoples within a few hours' journey of one another.

The ordinary man of to-day going about his daily work does not realise that when he steps into a tube lift he has under him a drop as great as that which killed poor Mr. Gilmour, and that the only thing between him and eternity is the knowledge of the engineers who designed and made the cables which support the lift, and the safety brakes which are supposed to stop it if the cables part. One always hopes piously that those safety brakes will really act, but so far as one can gather they are not often tested under genuine working conditions, for this can only be done by the sudden severing of the cables under a full load.

In the tubes themselves the probability is that if a wheel came off a leading coach, the train would pile itself up in a hopeless mass in the tunnel, and most likely the debris would catch fire, and everyone in the tunnel would perish miserably. In a motor car one drives considerably above the speed limit along a river side without ever thinking that if a five-eighth bolt in the steering gear happens to give way one would probably be buried beneath the car in the river and drowned like a rat in a trap.

These are cheering thoughts, and such things used to happen in the early days, but lift accidents, tunnel accidents, railway accidents, motor-car accidents, though they still occur once in a while, have become few and far between, thanks to the experience of the various constructors, and practically negligible in number when compared with the quantity of people using these methods of locomotion. In the same way, aeroplane accidents are steadily growing fewer and fewer in proportion to the number of aviators, and the number of miles flown, and will become more and more rare as time progresses and knowledge increases.

Aeroplane fatalities would become even less frequent if aviators and constructors would avoid methods of construction and design which can only be described as utterly foolish. Mr. Gilmour's is the first death in this country due to an absolutely unforeseeable cause, and for all we know even this might have been avoided if we had greater familiarity with the conditions of aeroplanes in the air, but in the present state of knowledge it certainly could not have been foreseen; almost every other fatal accident which has occurred was practically avoidable if ordinary common sense had been used, or else was not inherently an aeroplane accident at all, as in the cases of Mr. Benson and Mr. Cecil Grace, not to mention many more on the Continent.

As a matter of fact, out of the hundred and odd fatal accidents which have occurred on aeroplanes in the past two years it is practically certain that not more than twenty, to put the number as high as possible, were accidents which could not have been foreseen and avoided, even with the little knowledge at present at our disposal. There is no excuse for any aviator being killed if he is within 50 ft. of the ground at a normal flying speed; there is no excuse for wing stays breaking under any circumstances; there is no excuse for controls going wrong; there is no excuse for a man being crushed by his engine; there is no excuse for a propeller being so placed that it can damage any part of the machine if it bursts; there is no excuse for placing an aviator so that if the machine runs into anything he takes the first shock; there is no excuse for a machine which dives and refuses to come back; there is no excuse for a machine which, if it side-slips, will not right itself

after a drop of 100 ft. or so; and there is no excuse for a machine which swings round towards the lower wing owing to the warp overpowering the rudder when the pilot is warping in an endeavour to raise that wing.

Practically all the fatal accidents have been due to one or other of the above causes, and such accidents must be stopped at all costs. Genuine accidents will happen, and we must do our best to avoid them, but foreseeable accidents, though they cannot be punished as criminal offences, should, at any rate, be published by the fullest exposure of their causes, and it is only to be hoped that when the Royal Aero Club is fortunate enough to possess a uniformly able and practical committee the club will make it its duty to take the subject up with a very strong hand.

THE INVESTIGATION OF ACCIDENTS.

It is understood that the Royal Aero Club has instituted an inquiry into the accident which resulted in Mr. Gilmour's death, and that the report, though it cannot be published in the ordinary way, will be made a confidential communication to the members of the club. If this investigation and report is made by a competent and unprejudiced committee it is certainly the right thing to do, and similar investigations should be made whenever a really serious accident occurs, without waiting for an aviator to be killed.

Studying the causes of an accident after a man has been killed savours too much of shutting the stable door after the horse has been stolen; whereas, when a man has had an accident which might easily have cost him his life, that accident may be investigated with much greater profit, because it is generally possible to obtain, at any rate, a little information from the pilot when he is sufficiently recovered. For example, in the case of Captain de Winckels' accident on Salisbury Plain, on the same day that Mr. Gilmour was killed, a thoroughly searching investigation should be exceedingly useful. That Captain de Winckels survived the smash is, apparently, a combination of wonderful luck and a wonderful constitution, and even now it is quite probable that he is not absolutely out of danger.

It has been stated that Captain de Winckels remembers nothing of what happened after starting to do a sharp right-hand turn, but there is nothing surprising in this, for, as the result of his accident at Bournemouth, the Hon. Alan Boyle does not even remember flying on that particular day. There are numerous theories about the causes of Captain de Winckels' accident, many of which seem based on sound reasoning, and it would be quite as well to have this cleared up as far as evidence will permit.

In the case of Captain Watkins' accident at Brooklands on Sunday last, close investigation is also required, for one rumour has it that the elevator jambed; while quite reliable evidence is forthcoming that Captain Watkins was working his elevator up to the moment when the machine was actually diving vertically from a height of at least 40 ft. That he was not crushed by the engine was purely a matter of luck, in that either he was thrown or jumped sideways as the machine struck, everything in front of the engine being smashed to matchwood.

Investigations such as these are quite as necessary in the interests of manufacturers of the machines concerned as in the interests of aviators, for if inaccurate theories as to the causes of accidents obtain general credence, a good machine may be condemned on account of a bad pilot; while if it is thought that such accidents were due to the pilot himself, a good pilot may lose his reputation although he escapes with his life, and a thoroughly dangerous machine may escape condemnation and continue its man-slaying career.

GOVERNMENT MOVEMENTS.

In a very few days the whole Government policy as to aviation will have been announced, and it will probably be found then that quite a satisfactory programme is in hand. It has been suggested in these columns and elsewhere that a sum of at least half a million pounds is necessary if anything like an adequate scheme is to be undertaken, and one is able to gather that the sum set down in the Army Estimates will approximate fairly closely to this figure, though, perhaps, rather under than over it.

It is also understood that the scheme includes, besides the central Army and Navy school on Salisbury Plain, the establishment of other aerodromes in various commands, among these being an aviation school on the Curragh for the Irish Command, which should be a very great success as the country round is eminently suited for aviation, being inferior only in excellence to Salisbury Plain and the country round Huntingdon. It will be remembered that this idea of a multiplicity of military aerodromes was advanced in The Aeroplane some weeks ago.

Another exceedingly satisfactory action on the part of the War Office is that the grant of £75 to officer aviators who have qualified for their certificates is now being paid, without waiting for the fulfilment of the original intention that the officer applying for it should be attached to the Air Battalion for his "refresher" course.

From this action one may deduce that the old idea of having a small nucleus Air Corps in the Air Battalion, to which officers of other regiments are to be attached at intervals, does not find a place in the new scheme, and it is practically certain that the Air Battalion will be so greatly increased in size that the intention to have merely a hundred officers belonging to various regiments attached temporarily to the Air Battalion will now be replaced by a scheme to have considerably more than a hundred officers on the permanent establishment.

The orders for machines have not been definitely placed at the moment of writing, but the inquiries to the various firms have been so worded as to leave no doubt that, in the event of these firms satisfying the authorities as to the reliability and efficiency of their machines, the orders will be placed for delivery before the end of April. Altogether the organisation of our Air Corps seems to be shaping in a highly satisfactory way, and it must be remembered by everybody concerned with aviation that the one man of all others to whom this action is due is Colonel J. Seely, the Under-Secretary of State for War.

Speaking at a recent meeting, Colonel Seely said he entirely agreed that, as we had a small Army, we ought to be better armed than any other military Power, and it was the bounden duty of those responsible to see to it—taking an average of years—that we ought to be the best armed of any Power. What

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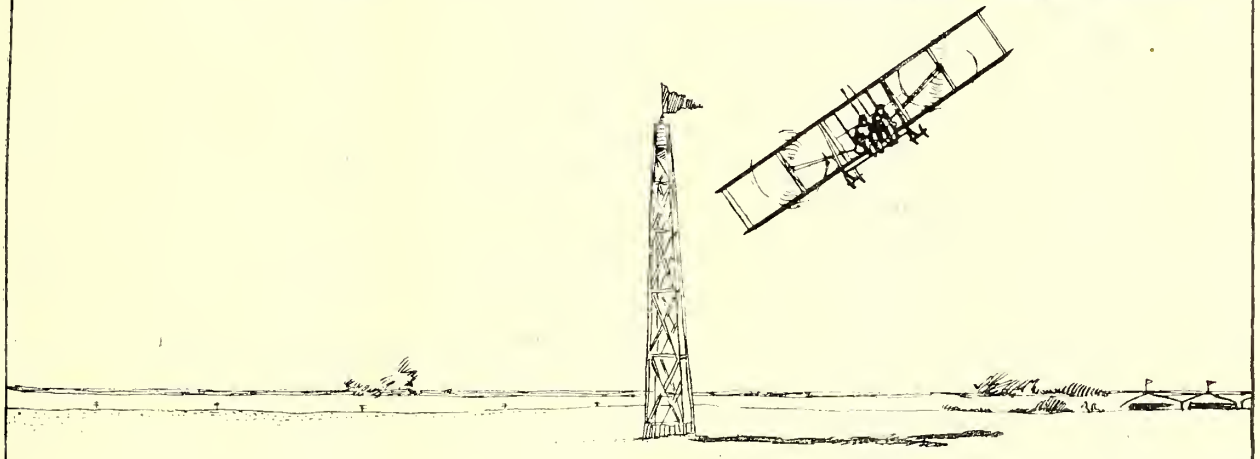

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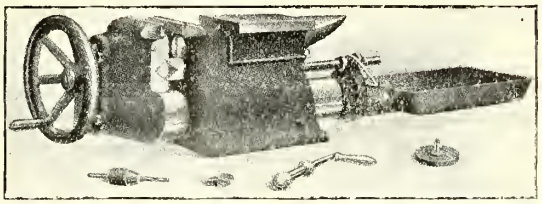

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we had to see was that on balance we were the best armed of any nation in the world for a series of years. He could promise them, so long as he had the honour of holding his present office, that that was the only aim for which he would always work.

On that occasion Colonel Seely was referring to the question of rifles, which is apparently almost as pressing as that of aeroplanes; but, knowing Colonel Seely's sentiments, the writer can vouch for the fact that his remarks apply quite as much to aeroplanes as they do to rifles, and so long as Colonel Seely remains in office one may be sure that our Air Corps need have but little to fear as to the treatment they may expect and the machines they will have to fly.

FURTHER NOTES ON THE ROYAL AERO CLUB.

As the Royal Aero Club election comes nearer the feeling is undoubtedly increasing among the active members that a thorough change is needed in the constitution of the committee, and that if possible a new chairman should be elected. Everyone recognises thoroughly the excellent work Mr. Roger Wallace, K.C., the present chairman, has done in the past, and realises that he has done his best according to his lights, but it is felt that a club of the size and importance of the Royal Aero Club should have as its chairman a man whose words carry the greatest possible weight among the ordinary members of the club, besides being able, when necessary, to bring considerable influence to bear among the most powerful people in the country. It is, therefore, earnestly to be hoped, as was suggested last week, that Sir Charles Rose, M.P., will be able to spare sufficient of his valuable time to act as chairman during the coming year.

It would also be a decided step in the right direction if a new chairman could be elected by ballot among the members of the club, though, of course, it is more usual for the chairman to be elected by the committee over which he is to preside. Even in the latter case the election should undoubtedly be by ballot, for in the writer's experience many unpopular chairmen have been elected by the simple process of having a friend ready to jump up at the first meeting of the committee to propose this particular person as chairman. This operation usually succeeds, for a man must be very unpopular indeed before another member of the committee will get up and propose a direct negative to his election. Of course, such a scheme is not likely to be sprung on the committee of such a body as the Royal Aero Club, but it is always as well to recognise the fact that unless the election is by ballot the real feeling of the committee as to who should be their chairman is not likely to be discovered.

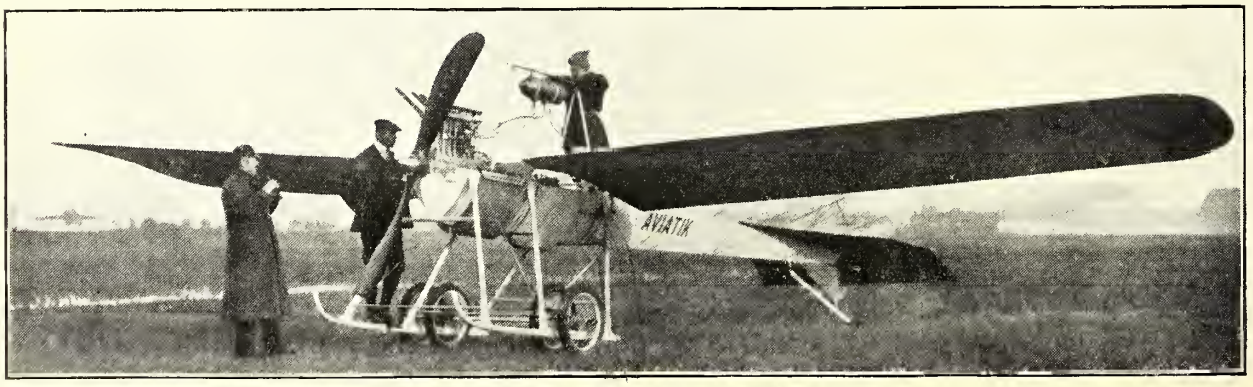
A further point in connection with the annual general meeting of the Royal Aero Club is that certain members have been dissatisfied because the club accounts have not been published in full, and because most of the members do not quite understand the position of Aero Proprietary, Ltd., which is the actual body owning the club.

It is, of course, obvious that the actual finances of the club must be in the hands of a limited company, otherwise the liability of each individual member would be unlimited; but the impression unfortunately exists among certain members that because the club is a proprietary club the shares must be held by certain individuals who, in the present state of comparative prosperity of the club, may very possibly be making a handsome profit out of it, and that the accounts are withheld from publication owing to the desire to hide this profit. In contradiction to this, it should be noted that the Articles of Association stipulate that no profits are divisible.

The writer is, however, in a position to explain that the shares of Aero Proprietary, Ltd., are held by the committee of the Royal Aero Club, and that when a committee-man retires his shares are transferred to the member elected in his place; also the directors of Aero Proprietary, Ltd., are the committee of the club for the time being.

The accounts of the club are not published in the ordinary way, but they are made up in time for the general meeting, and are handed round at the meeting so that any member who is at all unhappy as to the way in which the club funds are dispensed has only to attend at the meeting and see for himself. Also, if any particular group of members do not approve of the way in which the club finances are conducted, it is open to them to propose a new member for the committee at the next election, and by a proper campaign to get him elected so that he becomes a director of Aero Proprietary, Ltd.

As a matter of fact, the writer is strongly of the opinion that when the balance sheet of Aero Proprietary, Ltd., is issued at the general meeting it will be found that the club finances have been most excellently managed, and there is no doubt that the members of the Royal Aero Club have been able to have considerably better value for their small sub-



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scription than have the members of most clubs, if they have availed themselves of their opportunities.

The latest nominations for the committee are—in addition to Capt. J. D. B. Fulton—Mr. Fred May, Major Lindsay Lloyd, Mr. Neill and Mr. Harry DelaCombe—all excellent men. Capt. Fulton's election should be a matter of course.

Mr. Fred May is, besides being the chief of the Green Engine Co., a thorough good sportsman, who has a very heavy stake in the ultimate success of aviation in this country, and, as a committee-man of one of the leading motor-boat clubs, he has had just the kind of experience which is most needed on the committee of the Royal Aero Club.

Major Lindsay Lloyd is the ruling spirit at Brooklands; he is one of the finest organisers in this country, he has done excellent work at practically every aviation meeting yet held in this country, and his interest in flying is of the keenest. He also would be far more valuable than many members of the existing committee.

Mr. Neill is a sportsman of the very best type. He has presented valuable prizes for competition among the aviators at Brooklands, and he can always be relied upon to assist with every means at his disposal whenever help is wanted. Though not himself an aviator, his knowledge of aviation is very considerable, and he also will be a very valuable addition to the committee.

Mr. Harry DelaCombe has also proved himself a first-class organiser; his experience of aviation from the very start is probably greater than that of any one man in the country, and he is practically as much at home among Continental aviators as he is among those here. Not only has he these qualifications, but he is a thoroughly good practical man, who has a wonderful knack of finding out the good and bad points of both men and machines. In fact, he is what one must call, for lack of a better term, an "aviation expert," in the true sense of the word.

THE AERONAUTICAL SOCIETY ELECTIONS.

The Aeronautical Society, as well as the Royal Aero Club, is about to elect a new governing body. Under the rules, the retiring members of the Council are Lord Montagu of Beaulieu, Col. F. G. Stone, R.A., Capt. A. D. Carden, R.E., and Messrs. T. W. K. Clarke, J. W. Dunne, John Dunville, J. H. Ledeboer and F. K. McClean.

It will be hard to find better men to replace any of these, but there certainly seems to be a certain precipitancy in the action of the Council, for the notices concerning the election were only sent out on February 22nd, and therein is contained the warning that nominations for the Council must be received by the Secretary on or before February 28th, which only gives those wishing to elect a new councillor six days in which to make their arrangements. Certainly a fortnight would have been none too much. However, even if no new councillor is elected the Society will not suffer much. One wishes, however, that there was a little less balloon and a little more genuine science on the Council.

The annual general meeting is to be held at the Royal United Services Institution at 8.30 on March 27th, and it is to be hoped that then members will see fit to re-elect from among the retiring members of the Council, at any rate, Lord Montagu, Capt. Carden, Mr. Dunne, Mr. Ledeboer, Mr. McClean and Mr. Clarke, who are all very keen workers and men of very great influence in the right direction. A number of alterations in the rules are to be discussed and members should be present in force.

German Military Aviation.

Sixty German officers have been attached to the Johannisthal aviation schools, and all are to pass out fully trained by the middle of April.

The German War Department is buying machines in quantities, fifteen biplanes having been ordered from the Rumpler firm alone. It is also said that at the beginning of May sixty more officers are to be ordered to Johannisthal. Those passed out from Johannisthal are to go to the military camp at Doeberitz for further training on purely military work.

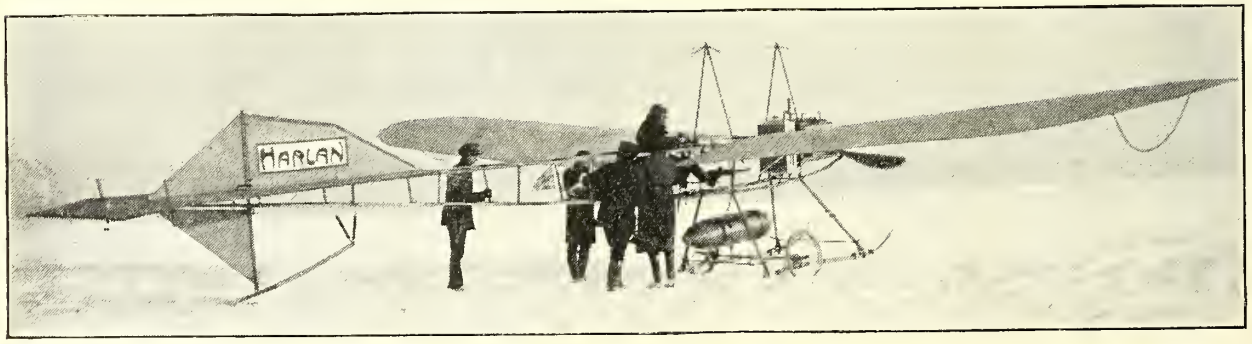
A new military aviation camp is to be opened at Kummersdorf and one at Juterborg, near to it, the latter being under ordinary circumstances an experimental ground for heavy artillery, so that apparently it will be used also in training air scouts in the observation of artillery fire.

Parseval XI has been definitely taken over by the German Army, after leaving Tegel about 5 p.m. on the 18th, and remaining in the air till 9.50 a.m. on the 20th, bringing down still enough petrol for a further eight hours. A useful exhibition of night work.

Italian Army Aviation.

For some time one has realised that Italy has determined to organise a large and efficient aerial fleet. At the present time the Italian Army possesses a perfectly equipped air corps of moderate size, in all fifty aeroplanes and nine dirigible balloons of fairly recent type. The war with Turkey has supplied the military authorities with sufficient information to guide them in their plans for the future and in the selection of aeroplanes. General Spingardi, Minister of War in the Italian Government, intends to apply to Parliament for a sufficient sum to enable his department to purchase another 250 aeroplanes and 15 dirigible balloons. If he manages to obtain this vote the Italian air corps will be but little behind those of France and Germany, and the Triple Alliance, consisting as it does of Germany, Austria, and Italy, will be even more dangerous.

W. E. de B. W.



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The Funeral of Douglas Graham Gilmour.

On Wednesday last week Douglas Graham Gilmour was laid to rest beside his father and mother in the little churchyard at Mickleham.

Early last year it was evidently borne in upon him that he was to lose his life flying. Gilmour was, as I said last week, in many ways a typical Highlander, so it may be that he had the gift of second sight which seems peculiar to the Celtic races and a few others, and so knew what his end would be. At any rate, he quite expected to die as he did, and he left in the keeping of a friend a letter which would perhaps seem extraordinary from anyone else, but is in reality so typical of its writer that one seems to hear him speaking as one reads it.

This letter runs :—

April 27th, 1911.

"If I am smashed up by aeroplane, which is extremely probable, I don't wish my body to be taken (to Mickleham Churchyard, where I wish to be buried near my father and mother) by the ordinary funeral hearse, which is a beastly thing, or by train. It is, if possible, to go by motor-lorry, and then if convenient by a four-wheeled farm cart. No mourning of any kind. Coloured flowers, if any. No moaning. I wish everyone to be merry and bright.

"If it is wished to put up a tombstone let it be a quarter-scale model of the 'plane I was killed with in stone, bronze, or iron, or model of the Big Bat, or other 'plane, it does not matter which.

"The remains of the 'plane I wish given to Clifton College. Perhaps it will be possible to re-erect it there—of course, provided they would like it.

"No bell tolling at the church—beastly idea! Dead March if they like—some of them are fine."

His wishes were carried out in the letter and in the spirit, except that we all felt his loss too deeply to be as "merry and bright" as he wished.

James Radley, one of Gilmour's oldest friends, who had served his time at the same engineering works, charged himself with the conveyance of his coffin to Mickleham. A smart little 15-h.p. chassis, such as Gilmour himself would have delighted in as a run-about, was rigged up as a light lorry and covered in purple and white, a purple pall veiling the coffin itself. Radley himself drove, with Gilmour's brother-in-law, Lieutenant Wauhope, R.N., beside him, and a dozen more of us followed on five other cars. It took just an hour to cover the fifteen miles or so to Mickleham, and never have I seen more perfect driving. Not once did the road-wheels of the lorry come to a stop. Where traffic seemed about to block the road judicious slowing up allowed it to clear away and leave a passage for the lorry.

Smoothly and steadily, with never a jar or a jolt, Radley, bare-headed in the drizzling rain, drove his friend through Kingston, over the lovely Surrey downs to Leatherhead, and so down the little valley road to Mickleham, a tiny village on the hill-side. Here we found waiting for us a few of Gilmour's relations and very many of his friends; so many, in fact, that the little church could not hold them all, and some had to stand outside while the vicar read the splendid service for the dead.

In obedience to Gilmour's wishes, no one wore mourning, and the coffin was almost hidden beneath a blaze of coloured flowers. There were none of the orthodox trappings of woe, artificial, morbid, and utterly insincere as they usually are. No depressing bell was tolled. The "Dead March" from "Saul" was played, and, in Gilmour's own words, "it was fine." Everything was "bright," despite the leaden sky and the rain, but "merry" we could not be. Each of us felt his or her own loss too keenly. There was no expression of sorrow for D.G. himself, for we felt he had died as he would have preferred, but every man and woman felt that somehow something was missing from the scheme of things now there was no D.G. to give free advice and scathing criticism, flavoured with that gift for quaint sayings which was one of his characteristics.

I did not myself think that Gilmour was a popular man. His wit was too keen for popularity among the many. But the way his fellow aviators came to pay their last respects, and the fact that they were so evidently and so deeply affected by his loss, showed me that, at any rate, he was thoroughly appreciated by all who really matter. Among those well known to the followers of aviation there came Mrs. Maurice Hewlett, Mrs. Handasyde, Mrs. Millbank, Major Lindsay Lloyd, Messrs. Perrin, DelaCombe. Hubbard, Grahame-White, George England, Johnston, Pizey, Keith, Eric Clift, Martin, Handasyde, Staplee Firth, Darroch, Neill, Petre, Lang, Sopwith, and many others.

There among his beloved Surrey hills we left Douglas Gilmour, a friend whose loss is irreparable, and a genuine martyr to the conquest of the air. *Ave atque vale.*—C. G. G.

The Memorial to D. G. Gilmour.

Last week a proposition was put forward in The Aeroplane that a subscription should be raised with the idea of setting up some form of memorial to the late Douglas Graham Gilmour. The proposition has met with a considerable amount of approval, and the following have consented to act as a provisional committee to deal with the matter, viz.: Messrs. Harold E. Perrin, T. O'B. Hubbard, Harry DelaCombe, Staplee Firth, Eric Clift, and C. G. Grey.

The following subscriptions have already been promised: J. Herbert Spottiswoode, £5; the Brothers Pashley, £2 2s.; C. G. Grey, £2 2s.; E. W. Edwards, £2 2s.; Staplee Firth, £3 3s.; H. Knox, £5; Harold Perrin, £1 1s.; Frank McClean, £1 1s.

Further subscriptions should be sent to any of the Provisional Committee, or to the offices of this paper.

Any suggestions as to the form the memorial should take will be welcomed. A recent suggestion is that the sum collected should be invested under the control of trustees, and that the interest should be given as an annual donation in memory of Douglas Graham Gilmour to the Weybridge Hospital. It is thought that in this way more good can be done than by the erection of a stone or metal memorial, which is of no permanent service, whereas even a small donation to a hospital regularly given would not only keep his memory fresh, but would be of permanent service in perpetuity.

The Structure of the Air.

Dr. W. N. Shaw, in *Science Progress*, has recently described the structure of the atmosphere. At the surface is the temporary current of wind, which may move as fast as 80 m.p.h. in exceptional cases, and is broken up into eddies by all suitably-shaped obstacles in the way of the flow. The speed of currents generally increase with height above sea level till the greatest speed conformable with the distribution of atmospheric pressure is attained. That may be called the gradient wind. Above that level there are different kinds of structure on different occasions. There is the "solid" current (such as one imagined the surface current to be), which keeps the same speed and direction at all levels; and at higher levels, within 10,000 ft., exist winds of an increased velocity; or a calm; or a reversed wind; or a cross wind.

This vertical structure or distribution of the currents of air is disturbed by local ascending or descending columns of air, such as the late Rev. J. M. Bacon described as spiral columns of air which helped to keep the lower levels fresh by contributions from above. The positions of these columns of ascending or descending air may be indicated by detached clouds. Between these clouds a distributed adjustment must be going on to make up for the displacement effected by the column of air; so that there are currents of air moving near one another.

The broader currents, which may be from eight to thirty miles wide, are made up of heterogeneous streams of air running alongside, and the juxtaposition of these streams may give rise to the destructive phenomena of the line squall. A line squall, according to another illustration suggested by Dr. W. N. Shaw, is like the breaker of a bore which is travelling up a river. It advances athwart the surface wind, and at a greater speed than that wind, and we may imagine it produced by an upper wind which at a moderate height has twice the velocity of the surface wind. As the upper air gains on the surface air the crest of the advancing cold wave topples over, driving up the warm air, and sweeping away the warm air in front of it.

From France.

Writing from Paris, on February 17th, M. Pivot, the well-known French constructor, says:—"I have just seen in the evening papers the death of Graham Gilmour. I regret very much that terrible accident, which impresses me very deeply, and I am sure that all the French aviators will have the same feeling."

On the Selection of Military Aeroplanes.

BY W. E. de B. WHITTAKER.

The conditions regulating the coming military aeroplane competition all relate to one species of machine—the two-seater—and the collective existent virtues of all types are demanded by the draughtsman of these conditions of the double-seater. It must rise faster than the average single-seater, carry a load which is not normal in a multi-seater, and glide as no aeroplane harassed by exacting conditions could do as a matter of course.

These regulations naturally set up an ideal worthy of attainment, but it is to be hoped that they do not represent the views of the War Office as to aeroplanes most desirable for use as a military weapon. Imitation is either conscious or unconscious, and one cannot say more than that the French trials of last year have had considerable influence in the arrangement of the promised English trials. The French Ministry of War, in their regulations, ordained that all aeroplanes competing must be capable of carrying three people, and consequently perhaps a similar clause appears in the English rules. Those who draught conditions are frequently so absorbed by their work that while they will embody some rule which has been found desirable in other countries, they do not take the trouble to ascertain the reason for its desirability in those countries.

The French military trials were initiated under circumstances very different from those about to take place in England. France had already a nucleus aerial fleet of high excellence, and an organisation which duly recognised the great importance of aviation to the Army. Those in authority had knowledge of the most able manufacturers in France, and of the most suitable machines. But in France, as elsewhere, public opinion is of importance, especially in these days of unstable, short-lived Ministries, and it was felt that it would be wise to institute some sort of competition which, while it might bring out some excellent ideas, would at least endorse with approval the previous purchases of the Army, and prove to the public that wisdom hides in dark places, even in the Ministry of War. And so it happened.

With one notable exception, those makers who had previously received most benefits from the Army had the greatest success in the trials.

But in England the circumstances are different. Public opinion is not interested in aviation. The English were never deeply interested in anything new. The philosopher-lawyer who controls the British Army with a Napoleonic air, when he is neither talking of the absurdity of war nor imposing visitations on the German Emperor, cares nothing for aeroplanes. They cost money; they are dangerous; and to be of any use at all they must be, at the worst, of greater efficiency than his pet rifle. And all these things mean trouble to one in whose life the avoidance of trouble has become a sacred duty.

But, despite the philosopher and the people, the aeroplane is to take its proper place in the British Army, and the War Office, impelled by pressure from within and without, has decided that a trial must take place, but not for the reasons that dictated the action of France. We have to lay the foundations of our aerial force. Therefore our aeroplane trials should be comprehensive.

Sections should be arranged for each of the three types of importance—the single-seater, the two-seater, and the multi-seater. It is obvious that these three types will not possess the same powers. An Atlantic liner is outpaced by a hydroplane, yet it has its uses.

As even the most dreamy of War Office officials cannot expect one type to be an agglomeration of the virtues of all three, one is forced reluctantly to the conclusion that the authorities have decided to purchase two-seaters exclusively, under the impression that this type is most suitable for military purposes. A sign that this conclusion has some foundation on fact is to be seen in the recent purchases by the Government of a Bréguet, a Nieuport, a Deperdussin, a Blériot, and a Bristol, all of them two-seaters.

By what manner of reasoning the War Office has arrived at this peculiar decision is unknown, but that it is an erroneous decision is the opinion of all those with whom I have discussed the question and who are best qualified to judge. Some sappers may agree with the decision, but no soldier can. It is imperative that a large number of single-seater monoplanes shall be acquired by the Army.

A certain number of single-seated monoplanes, both slow and fast, ought to be allocated to the training of military pilots. It will be neither possible nor advisable to train all the Army pilots in civil schools, and therefore adequate provision must be made for their aerial education in military flying schools. At present the few officers who form our Air Battalion are handicapped by the fact that all the efficient Army machines are two-seaters.

It is not pleasant for a pilot who has learnt to fly on a biplane of antique design to make his first essay in the control of a monoplane alone on a powerful two-seater of that type. Yet that is what is happening on Salisbury Plain. There is not even an officially owned Anzani-Blériot for wood-breaking experiments. But perhaps this is a deep-laid plan to stifle in their youth the birdlike aspirations of the officer aviators.

Then as to the place of the single-seater in war. The French think this the most important of all types, and the different manœuvres in which aeroplanes have taken part only accentuate the value of a number of swift, small aeroplanes to a general commanding an army.

Take the case of two opposing armies, neither of which is defending a fixed position, but both of which are manœuvring for the advantage of position before engaging. The reconnaissance which takes place before the opposing forces come into touch is technically known as strategical reconnaissance, and is carried out to ascertain the enemy's approximate numbers and dispositions. The preliminary part of strategical reconnaissance, that of detecting the apparent direction of the enemy, could be well done by several high-speed single-seaters piloted by officers whose faculties of observation have become highly developed through practice. Scouting by an aeroplane manned by both pilot and observer would teach but little in these early stages, and the delay would be longer. Until the armies are in touch it would be the aerial scout's duty to prevent surprises and to warn the general officer commanding of any unusual move on the enemy's part.

When the armies come into touch, the form of reconnaissance becomes tactical instead of strategical, and the information sought relates to the tactical disposition of the enemy. As soon as the battle is opened, the duties of the two-seater are carried out, and by means of a number of them an exhaustive reconnaissance of the enemy's dispositions is made, with considerable attention to detail. The reports of the observers thus engaged will then be delivered to the General Staff, which will, by comparing them, be able to come to some idea of the enemy's intentions.

This information gained, the duties of the two-seater are over, in so far as reconnaissance is concerned, and the single-seater enters the scene again. A quantity of small machines will be sent up, proportionate in number to the area of ground covered by the opposing armies. Similar orders will be given to two or three pilots, so that elimination of some pilots by death is less likely to affect the information gained. Each little group will be instructed to watch the development of some move of the enemy, and report at, say, intervals of half an hour, unless something startling occurs.

At the present one can only deal of the use of the aeroplane for scouting, and the carrying perhaps of such important despatches as have to be committed to paper and to be conveyed with speed. Of the offensive employment of aeroplanes, as in the dropping of bombs, one can say but little, as the field is wide and the information inadequate.

It is clear that any army in any campaign in which the use of aeroplanes is possible requires attached to it a large force of single-seaters. It is therefore clear that, as the British Army has none in its possession, a number should be bought at once. During the last ten days it has been public knowledge that the Government intends to order twenty or thirty machines at once, and that specifications, etc., have been asked for from several manufacturers. As no definite step has yet been taken, would it not be well if the War Office were to order single-seaters only in this preliminary purchase?

England cannot afford to wait in the race for aerial supremacy. Each moment's delay means greater expense in the future and greater dangers in the present. Mistakes made now are of fundamental importance. It is useless to buy aeroplanes haphazard, without regard to requirements, simply as a sop to manufacturers. It takes no longer to order according to obvious necessities, and your manufacturers reap exactly the same reward. And, finally, so far as the Government is concerned, aviation is not a party cry or an election "gag," and consequently does not require stifling or feeding according to the health of the political weathercock.

CONTINENTAL NOTES.

Védrines, continuing his habit of breaking records, succeeded at Pau on February 22nd in flying 159 kilometres 303 metres (approximately 99 m.p.h.) in the hour. The machine used for this purpose was a Deperdussin monoplane fitted with a nominal 140-h.p. engine. The greatest speed attained during the flight was 105 miles an hour.

Below are M. Védrines' times compared with the previous record :—

	Védrines. Feb. 22, 1912	Bathiat. Jan. 27, 1912.	Tabuteau. Jan. 23, 1912
	h. m. s.	m. s.	h. m. s.
50 kilom. ...	0 19 3 4-5	20 43 1-5	
100 ,, ...	0 37 58 2-5	41 29 3-5	
150 ,, ...	0 56 41 2-5		
200 ,, ...	1 15 20 4-5		1 54 21

	Védrines. Feb. 22, 1912.	Védrines. Jan. 13, 1912.
	k. m.	k. m.
¼-hour ...	39 303	35 0
½ ,, ...	79 303	70 0
1 ,, ...	159 303	142 430

Tabuteau, flying a 50-h.p. Morane at Pau, made a flight of two hours on February 23rd. During the flight he made the following times and broke the records for those distances above 100 kilometres :—

100 kilometres in ... ... 52 mins. 20 secs.
150 ,, ,, ... 1 hr. 18 mins. 45 secs.
200 ,, ,, ... 1 hr. 45 mins. 14 2-5
1 hour he flew 114 kilom. 231. 2 hours he flew 227 kilom. 454.

M. Roger Sommer has challenged M. Armand Deperdussin to race a Deperdussin monoplane fitted with a 70-h.p. Gnôme against a Sommer monoplane also fitted with a 70-h.p. Gnôme. He does not say which pilots should drive the machines. The important clause in the challenge is that the fuel used must be pure petrol which must mix in the usual way with undoped air. Oxygen cylinders must not be used. This challenge is to call attention to the manner in which certain records are said to have been broken recently. Readers interested in motor racing will remember that the use of oxygen cylinders has been forbidden in competitions at Brooklands since 1908.

Paulhan himself has been flying his new Curtiss hydro-aeroplane, *Le Triad*. In the bay of Juan-des-Pins on February 23rd he made several flights to satisfy certain military requirements. One gathers that he desires to sell Curtiss aeroplanes to the French Army. Captain de Goys, who is an army aviator, represented General Roques, Inspector-General of Aeronautics. M. Paulhan, with Captain de Goys as passenger, passed over the men-of-war in the bay at a height of 250 metres. In his second flight, alone, he rose to a height of 1,600 feet in five minutes, and descended from that height in a gliding flight with the engine stopped. Later Mr. Robinson took over *Le Triad* and made a fine flight with Lieut. Stachovski, Imperial Russian Navy. It is probable that Russia will make some purchases for the Russian Navy.

It is rumoured in Paris, with what truth one is unable to say, that M. Latham is returning from Africa and has purchased a hydro-aeroplane of the Canard type, and that he intends to pilot it at the forthcoming meeting for hydro-aeroplanes at Monaco.

Two young men walking on the shore in the neighbourhood of Nice found on the shore a bottle apparently recently thrown up by the waves, containing a paper on which were these words : "Engine stopped. Wind violent. I have fallen within sight of Calvi. Adieu, Bague." Lieut. Bague was lost while attempting a flight from France to the Balearic Islands. The authenticity of the message has yet to be proved.

The brothers Peugeot have offered a prize of 10,000 francs for two flights of ten metres made on an aeroplane propelled solely by the muscular energy of one man. The flights are to be made in opposite directions in immediate succession, so that no advantage may be obtained from the wind. The prize can be competed for after June 1st next. A prize of £4,000 has also been offered by the paper, *La Justice*, for the first flight of this type from Paris to Versailles and back without landing. At first sight the whole project seems absurd, but when such names as Maurice Colliex, Gabriel Voisin, and Lieut. de Vaisseau Cayla are mentioned one realises that there must be possibilities of success for man-driven aeroplanes. It is sincerely to be hoped that something may be done, as nowadays there is a notable lack of amusing sights.

At Villacoublay, on January 24th, Gaubert, on a four-seater Astra-Wright, made a flight of an hour and a half with Lieut. Scott, in order to test the latter's apparatus for discharging bombs. From a height of 900 ft. he, at the first attempt, sent a bomb to within sixteen feet of the centre of a circle ten metres in diameter. At the second attempt the missile struck the ground within nine feet of the centre.

A pupil of Gorrissen's named Schmidt, while flying on February 15th in the neighbourhood of the Johannisthal Aerodrome, fell from a height of fifteen hundred feet owing to the failure of his elevator. He broke his arm and is severely injured internally. The shock on hitting the ground was so great that not only was the aeroplane entirely wrecked, but the engine was disintegrated.

On the afternoon of February 24th, at Pau, Lieut. Ducourneau was killed whilst flying a monoplane. It is reported that he was at a height of over 600 ft. when his propeller broke and he lost control owing to the consequent dive. The machine fell headlong to the ground. The pilot died instantly. His body was terribly injured.

Apparently other patents dealing with aviation than those of the Wrights will worry the French courts of law shortly, as it is announced from Paris that the R.E.P. and Blériot firms have combined to protect the patents regulating the use of a single lever for the controlling of the elevator and of wing-warping. One did not know previously that this was a contested point.

The municipality of Nancy has decided to open a public subscription towards the purchase of an aeroplane to be presented to the 11th Division of Infantry in memory of General Langlois, a distinguished Senator, who died recently. This aeroplane is to be named the "General Langlois."

The company performing at the Chatelêt Theatre in Paris has also raised a subscription to buy an "*avion*," as the French Army aeroplanes are called, and are being assisted in their efforts by the proprietors and manager of the theatre. The machine is to be called "Le Chatelêt." There seems to be a suggestion here for some of the London theatres, which I hear are doing so well at present, in spite of industrial upheavals and Liberal Government. "The Criterion" would be rather a *chic* name for an Army machine, but "The Hippodrome" would surely be a little out of place in an aerodrome.

The Municipal Council of Paris some time ago formed a technical commission for the consideration of methods to insure greater safety for aviators. This commission met on February 23rd at the Prefecture of the Seine, under the presidency of M. Armand Bernard, Secrétaire-Général of the Prefecture, representing the Prefect. Five councillors of the Municipal Council and Messrs. R. Soreau, of the A.C.F. ; René Quinton, of the L.N.A. ; Commandant Renard, Esnault-Pelterie, Capt. Marie, and M. Toussaint, of the University of Paris. They considered several schemes in general, and finally decided to appoint a small sub-committee of three, which meets on February 28th to discuss proposals presented by certain inventors.

Lieut. Féquant, one of the first aviators to be trained for the French Army, who has made many very excellent flights during the last two years, is now amazing the natives of Sénégal. At first a Farman pilot, he now flies a Nieuport with great success. He has recently made flights in Sénégal averaging 100 kilometres in length. This officer's name has been of late too little before the public, when one remembers the amount of work he has done for military aviation, and his great popularity in France.

The great names of aviators of the early days have become inseparably associated with individual types of machines, and it is startling nowadays to find old devotions left and new arrangements made. Bielovucic, a name one instinctively connects with the firm of Voisin, who, in 1910, made a great flight (in those days) from Paris to Bordeaux, is now flying a Deperdussin at Béthény. A week or so ago he made a flight of 3 h. 10 m. over the surrounding country.

Last week at Heliopolis, near Cairo, the monument erected to the memory of M. Mouillard was unveiled. M. Mouillard was the inventor of wing warping as a means of maintaining the lateral stability of aeroplanes. As so often happens, his powers received but little recognition during his life. Up to the time of his death no power-driven flights of heavier-than-air machines had taken place, save those of Ader, on the Avion, in the early 'nineties. Mouillard died at Marseilles in 1897, in straitened circumstances. The monument was erected to his honour by La Ligue Nationale Aérienne of France. It is understood that no subscription was received from the Wright Brothers.—Pingouin Rose.

Busy Eastchurch.

Eastchurch, once a howling wilderness, only approachable by wading up to one's knees in a sea of mud, famine-stricken, depressing, and generally hopeless, is now one of the busiest, most workmanlike, and cheerful places in this country. Where formerly one saw half a dozen tin sheds, and the workshop of the brothers Short, and, if in luck, an occasional flight by the late Mr. Cecil Grace—whose memory is dear to all who know Eastchurch—one finds to-day twenty-eight sheds all with authentic aeroplanes in them, various cosy bungalows, where those honoured with invitations to enter may hear more wit and wisdom in half an hour than in a month elsewhere, a manufacturing establishment where the Short Brothers can really turn out machines in quantities, busy workmen evidently with plenty to do and no time to waste, and on a moderately fine day half a dozen or more machines in the air at a time. All this is now approachable by a fine, sound road in five minutes' walk from the station.

Of late the place has been given quite an important appearance by the presence of a number of bluejackets and E.R.A's. from H.M.S. *Actæon*, who act as machine crews to the naval officers now in training. I gather that the sailors are taking to aeroplane work with all the keenness and adaptability typical of the Navy, and that the E.R.A's., never having seen an aeroplane engine in their lives before, have acquitted themselves in a way which justifies Kipling's friend, Mr. Emmanuel Pyecroft, in claiming for Mr. Hinchcliffe, E.R.A., that "if you give him a drum of oil and leave him alone he'll coax a stolen bicycle to do type-writing." I know the Navy hate being called "handy men," but it does not alter the fact that they are.

There is one thing a naval man will not do, and that is talk; so when one goes to Eastchurch one gets news of naval doings at second hand, or even further off, but I gather that the naval activity is great. The two Short biplanes on which the first four naval aviators learned to fly are still doing splendid service, and are likely to be used as training instruments for the later additions to the naval air corps for some time to come. The more experienced fliers are also experimenting with the three latest products of the Short factory, the triple-twin, the tandem twin, and the single tractor biplanes. Incidentally there is very keen rivalry between the Navy and Army for the longest distance in the Mortimer Singer competition, for though there is an equal prize for each Service, each is anxious to get ahead of the other, and the competition would be just as keen if the only prize were a bronze medal of no intrinsic value. Consequently it is quite possible that by the time these notes appear one of the Short machines may have succeeded in beating Mr. Barrington-Kennett's fine performance.

One sign of the activity at Eastchurch is the new workshop being put up by the Short Brothers. This should be ready early next month, and the capabilities of the factory will then be at least doubled, for the new shop is considerably bigger than the old one. All signs point to its being kept very busy, and I sincerely hope that the Short Brothers may be this year among those pioneers who will reap their reward for the plucky way in which they have acted up to their belief in the future of aviation by sinking money in aeroplane building and sticking to their guns till results justify their belief.

It may be well here to correct certain erroneous ideas which unfortunately exist concerning my good friends the Short Brothers. In the first place they have no official connection with the Royal Aero Club, beyond the fact that individually they are members of the Club just as most other manufacturers are. The Short works are not on the Royal Aero Club grounds, but on adjoining land, which is leased from its owners, just as any other manufacturer might lease a site for a workshop if he cared to do so. There is, therefore, no ground for the belief which some people hold that the Short Brothers have been particularly favoured by the R.Ae.C. as a club. The position simply is that certain members of the club, who were among the pioneers of ballooning as well as aviation, having had good balloon work done by the Shorts in the past, and wishing to experiment with aeroplanes far from public observation, placed orders for aeroplanes with them some three years ago, and the brothers, seeing far ahead, had the pluck to plant their aeroplane works in a wilderness, and by sheer good workmanship, and sound design, they have made their venture a success. They thoroughly deserve every penny of profit they may make out of it in the future. That the out-of-the-way location of the ground makes it a suitable place for experimental work with the naval machines is just a piece of good luck such as once in a while comes to the deserving.

However, apart from the Navy machines, and the Short machines, quite an amount of other work is going on. When I was there last week, Mr. Alec. Ogilvie was busy making experimental alterations to one of his Wright machines. He had fitted it with a beautifully made streamline *nacelle*, built of three-ply wood, one of the prettiest jobs I have seen. Then by way of experiment he had cut down the chord of the planes from about 6 ft. 6in. to 5 ft. 6in., and found the machine faster—as one would expect. Thereafter he had cut down the gap between the planes from 6 ft. to 4ft., reasoning that the saving of the head resistance of 2 ft. of each strut and the various wires would make the machine faster still. Against this there is the argument that the interference between the planes with a 5ft. 6in. chord and only a 4 ft. gap would reduce the efficiency and speed of the machine more than would be compensated for by the reduction of actual head resistance by shortening the struts. In practice, however, it turns out that the machine really is faster with the cut-down struts. Another peculiarity is that, though the machine flies faster, the same propellers and gearing are used, and yet the engine hardly shows any increase in its revolutions, and Mr. Ogilvie tells me that in America the Wrights use exactly the same propellers for their 60-mile an hour racing machines as they do for their 40-mile an hour "touring" machines, though presumably with different gearing. Aerodynamic theory is a quaint thing to reconcile with practice, and propeller theory is not helped by Mr. Horace Short's statement that in his tandem twin machine the leading tractor has a bigger pitch and diameter than the propeller which runs in its slip-stream, though the two engines, when tuned up, run at approximately the same speed.

Besides Mr. Ogilvie's three machines there is, of course, Mr. Leo Jezzi's now famous 60-m.p.h. 35-h.p. tractor biplane. There is Mr. Mortimer Singer's old Farman biplane pathetically waiting for someone to use it, and there is the Farman biplane belonging to A.I.R., Ltd, equally pathetically waiting for someone to buy it. There is Mr. Frank McClean's Short biplane, with side-by-side seats, and dual control, lent to the Territorials, whose official activities have been suspended by the War Office in a somewhat eccentric fashion, though in their private capacities several of them are going on with the work. There is the Hon. Maurice Egerton's Short biplane, a fine machine, finely flown; there is Colonel Capper's Dunne monoplane, shown at Olympia last year, which now really flies; and there is Mr. Dunne's own biplane, with a 60-80 Green, which has just been rebuilt. There is a whole collection of Short-Wrights, and original Shorts, all in quite good condition, and very likely to be transmogrified into more modern types, and, of course, there is Professor Huntington's weird "umbrellaplane," probably the quaintest thing in the world that really flies, which it does on occasion when the gods are feeling kindly, though I am told that its flying is as original in manner as its appearance.

There are probably a few more, which I have forgotten to mention, such as the Blériot-type "Birdling," on which the naval men perform at odd times, and by now Mr. Spencer Grey's Blackburn will have been added to the list; so that even when there is no flying there is always plenty to look at, and on reasonably fine days the quantity of flying is as great as at either of the London aerodromes, though the quality is, on the average, rather higher. Incidentally, the morning I was there, Engineer-Lieut. Randell, R.N., did the height test which completed his certificate tests, and so became the first naval man trained by naval men on a machine belonging to the Navy to become a certificated aviator. On the whole, Eastchurch is a busy place in these days, and it is likely to become a great deal busier before long.—C. G. G.

A Lecture on "Military Airships."

On Monday next, March 4th, Lieut. Clive M. Waterlow, R.E., Air Battalion, will deliver a lecture before the Aeronautical Society at the Royal United Services Institution on "Military Airships." Both the lecture and the discussion which follows are sure to be full of interest, for Mr. Waterlow is one of the most serious students of military aeronautics, and has done quite a large amount of military dirigible work, considering the limited means at the disposal of our Army. It is to be hoped that even those members of the Aeronautical Society who pin their faith to aeroplanes will attend this lecture, for whatever sound arguments there are in favour of dirigibles will certainly be put forward by Mr. Waterlow.

Some Remarks on Inherent Stability.

BY PROFESSOR G. H. BRYAN, Sc.D., F.R.S.

The problem of inherent dynamical stability in aeroplanes raises a large number of controversial points, and it appears probable that some time must elapse before differences of opinion can be reconciled between those interested in the theoretical and practical aspects of aviation. At present it is somewhat uncertain whether a post graduate student in mathematics could be induced to take up the study of the theory of aeroplane equilibrium and stability unless the subject can be shown to possess educational advantages as a training in research at least equal to those offered by investigations of a purely abstract character.

It would not be difficult to apply stability tests to modern aeroplanes, but grave objections might be raised against the publication of any theoretical discussion referring to inventions that have been placed on the market commercially. It is much better that the proprietors of such inventions should apply to them any tests of stability they may or may not think fit.

One authority will tell us that there are more important considerations, and that stability is not the *first* desideratum; another, that stability can never give a *final* solution of the problem of flight. Meanwhile aeroplanes are being used as to whose stability no conclusive investigations have been made.

To my mind the most satisfactory solution of the problem of flight would have been to investigate equilibrium first, stability second, and to leave the practical man in possession of the field after theory had done its level best. This is what would have happened if any mathematician could have been found who could have written "*Stability in Aviation*" ten years ago. In the interval there have been plenty of papers and treatises published of a highly specialised character on hydrodynamics, electricity, and similar subjects, quite conforming to the old Cambridge toast, "Here's to the latest theorem, may it never prove of any use to anybody."

For centuries past flying machines have been constructed or designed regardless of the fact that the forces acting on them, if moving through the air, could never maintain *equilibrium*. Even long before equilibrium was secured, a theoretical investigation of stability could easily have been evolved had the matter been taken up.

What is implied by inherent dynamical stability? It implies that an aeroplane will fly straight as long as it is undisturbed, and that if disturbed it will tend to resume its steady flight after the disturbance ceases. Instability implies that an aeroplane is always tending to topple over, forwards or backwards or sideways, or to acquire dangerous oscillations even in still air, as can be verified easily by throwing small model gliders. What usually happens with a glider is that, instead of flying straight, it twizzles round to one side or the other, coming to the ground with a corkscrew motion. This implies inherent lateral *in*stability.

Now a glider thrown in a room is of course a very different thing to an aeroplane which is being tossed about in squalls of wind, and people therefore argue that because there is the added danger of these squalls, it does not so much matter whether the aeroplane is stable. I should have thought that if an aeroplane could not be made to fly straight without its pilot making continuous efforts to prevent it from going astray, even when there was nothing to disturb it, then navigation would be increasingly difficult when the pilot had to overcome not only inherent want of stability but also the effects of outside disturbances. And I should further have supposed that it would be impossible to obtain anything like a final settlement of the best way of dealing with unavoidable extraneous sources of danger till inherent instability had been disposed of once and for all, and its effects eliminated.

Now there is one precedent which is extremely likely to lead people astray. We are generally told that the stability of a ship can be obviously increased by increasing the height of the metacentre above the centre of gravity; this, as a matter of fact, causes the ship to rock dangerously when in a sea.

Now there is an essential difference between statical and dynamical stability. The "statical stability" undoubtedly is increased by raising the metacentre, and the ship, if tilted sideways, will in consequence have a greater tendency to swing back again. But dynamical stability implies something more, namely, the extinction of oscillations, and I am not aware that anyone has made a thorough investigation of the dynamical stability of a ship ploughing through the water, even if there are no waves on the surface except those set up by the ship itself. If such an investigation has been made it will no doubt be very easy to correct this impression.

The report of Mr. Low's lecture on page 137 of The Aeroplane affords an example of the many complex questions that are likely to arise in connection with stability, and the importance of exercising great caution in deducing inferences from theoretical or experimental data.

The lecturer stated that, according to Bothezat's work, a machine could not be made to damp out its oscillations in less than six or seven seconds, and that in the meanwhile it might be struck by several gusts of wind. Granting these premises, is it correct to say "and therefore no machine can be really stable automatically"? The whole question depends on what meaning is attached to the word "stable."

As I have pointed out, the term "stability" is now used in a vague and indefinite sense, every person interested in aviation attaching a different meaning to it, often no meaning at all. I have even seen a book in which it was stated that stability was the same thing as equilibrium. But without going more fully into the matter, let us consider the analogous case of a ship.

A ship may be struck by a wave; before the disturbance has subsided seven other waves may have struck the ship. Is it correct to say that therefore no ship can be stable? Such a ship would at any rate possess the property that the disturbance at any time did not represent the aggregate effect of more than seven or eight waves. It would certainly be better than a ship in which the disturbing effect of the first wave had become practically infinite by the time the eighth wave struck it.

I think that dynamical stability may with advantage be left in the hands of the practical man for a twelvemonth or so, and so far as the matter concerns myself this will be necessary, as my time will be fully occupied for some time with questions regarding the teaching of mathematics. By that time minor difficulties will have cleared themselves up automatically, while if any real difficuties exist in reconciling theory and practice, these will have crystallised into definite forms, so that attention can be concentrated on them.

Moreover, I had always supposed that it would take people about a year or more to master the reasoning in "Stability in Aviation," but this calculation has been rather upset by your reviewer's marked success in studying and criticising the book.

The direction which seems likely to offer the greatest prospects of immediate progress probably consists in starting with simple theoretical formulæ for stability, based undoubtedly on roughly approximate assumptions, and testing the results by experiments with models. It is, of course, much more difficult to work with formulæ involving a large number of corrections, and probably a comparison between computed and observed results may do much to obviate this necessity. I should think that stability calculations based on the hypothesis of narrow planes gliding at small angles may well form the basis of a large amount of experimental work. As an analogous illustration the engineer who is arranging a service of electric trams does not base his calculations directly on the theories contained in Clerk Maxwell's *Electricity and Magnetism*, but on experimental data which those theories have been instrumental in placing on a formal basis.

May I add a few words on the question of "personal control"? I have had a fair amount of experience of what can be done and what actually is done by the "human element" in connection, not with aeroplanes, but with piano-players. It is probably safe to say that the efficiency of the average "piano-player player" in manipulating the controls of his instrument does not reach more than about 5 per cent. of the possible efficiency. An efficiency of over 50 per cent. is practically unknown, owing to the fact that in this case one of the most important and essential uses of the controls is ignored, and indeed very generally believed to be impossible. This power of control could easily be learnt by anyone with a few weeks' practice for half an hour every day, and the failure to produce the desired results is probably partly responsible for the comparative unpopularity of piano-players.

The control of an aeroplane must certainly be far more difficult to learn, and without going into further discussion it may reasonably be asked what are the prospects of success of a would-be aviator whose efficiency in the manipulation of the controls does not exceed 10 per cent. of that displayed by a Blériot or a Farman?

Your reviewer's kindly notice and Mr. Wheatley's sympathetic letter must be my excuse for breaking silence on the question of stability before my year's holiday has expired.

The Week's Work.

Certificate Winning at Brooklands, Hendon, and Eastchurch—Lieut. Longmore's Attempt on the Mortimer Singer Prize—Commander Schwann, R.N., Flying—Mr. Sopwith and the Admiral—The "Factory" Biplane at Brooklands—Territorial Aviators in Form—The First Short Monoplane's Performance—Mr. Grahame-White's Re-entry—The Flanders Monoplane's Fine Flying—Captain Watkins' Accident—Good Work at Barrhead—Hydro-aeroplaning on Windermere—Mr. Hewitt Honoured by Rhyl—Interest Growing at Eastbourne—M. Salmet in Regent's Park.

Monday, February 19th.

Brooklands.—Mr. Fleming up with Major Sir A. Bannerman teaching landing, then with Capt. Broke-Smith. Capt. Allen and Mr. Lane rolling on monoplane early in morning. Weather too bad later in day for any further work.

Tuesday, February 20th.

Brooklands.—Very windy. No flying.

The Plain.—M. Jullerot for trial flights, but postponed school flying.

Wednesday, February 21st.

Brooklands.—Mr. Merriam up with Lieut. Longcroft as passenger, then later doing 8's alone. Lieut. Smith took certificate in excellent style; Capt Raleigh doing first part of tests also. Lieut. Carfrae also did certificate tests, flying over 200 ft. throughout. Very fine performance. Landings excellent. Lieut. Longcroft and Capt. Allen also out. In afternoon Mr. Fleming up with Major Sir A. Bannerman, and Mr. Pizey with Capt. Broke-Smith. All Bristol pupils out. Congratulations to Messrs. Pizey and Fleming on number of certificates Brooklands school is getting, in spite of bad weather. And, be it noted, pupils are not rushed through, but are taught in a very thorough manner.

At Flanders School great activity, Mr. Kemp doing circuit alone, then taking Mr. Jacques and Lieut. Parke, R.N., as passengers, for long flights. Messrs. "Lark" and Manning doing straights and improving rapidly.

At Sopwith School, Mr. Raynham appointed chief pilot and instructor, took up Lieut. Parke, R.N., as his first passenger on Wright, and flew excellently.

At Avro School Mr. Young flying well, followed by Mr. Setti on Avro-Green. Latter doing circuit landed in Sewage Farm and turned over without damage beyond broken plane.

Eastchurch.—Lieut. Longmore, R.N., decided time was opportune for attempt on Mortimer Singer Prize, so with indomitable Lieut. Spencer Grey, R.N., as a passenger, started out at 9 a.m. on Short tractor biplane, carrying fuel for 8 hours, but unfortunately after flying exactly 100 miles in excellent style was forced down owing to Gnôme misfiring badly. He was about a mile from aerodrome, and about 1,000 ft. up, but by clever judgment of glide he succeeded in making the aerodrome, and landed with engine stopped well within boundaries. Five minutes later Mr. Grey was up again in his Blackburn monoplane, which he handles very nicely.

Hendon.—At. W. H. Ewen School Mr. Denys Ware, latest pupil, made good straight roll at first attempt. At next attempt rolling confidently with tail well up. MM. Baumann and Dubois each made fine flights, landing from 20 ft. and 30 ft.

At A.S.L. School Mr. Ridley-Prentice on school machine flying circuits in good style; on landing Mr. Busk took control of same machine. Then Mr. Ridley-Prentice out on Valkyrie racer for numerous flights, fog necessitating low altitude. Meantime Mr. Busk making excellent short flights, till fog getting very dense, he ran into wire fence by railway. Things looked unpleasant, as machine was travelling fast on ground. But Valkyrie skids rode up over fence, and beyond straining few wires no damage done.

At Grahame-White School Mr. Lewis Turner out on biplane No. 2, engine not pulling well, so handed machine over to engineers. Later out testing and finding engine running smoothly handed to Mr. Fowler, who flew several circuits until rain stopped further work.

At Blériot School useful work put in by Messrs. Hall, Pothet and Clappen, all practising straights, M. Pothet also doing short hops.

The Plain.—M. Jullerot taking up Colonel Defilipi, and afterwards Lieut. Fielding. Mr. Bendall good flight with Lieut. Fielding as passenger. Commander Schwann gave clever exhibition in four consecutive flights. Lieut. Brodigan for three flights; Lieut. Harrison for four flights. M. Prier out on Bristol two-seater monoplanes, with Lieut. Defilipi as passenger. M. Jullerot with Lieut. Fielding for tuition, afterwards taking up Lieut. Ercole, new pupil. Lieut. Wyness-Stuart three good flights on biplane, with fine landings.

Mr. MacDonald. the clever young pilot of the Vickers Monoplane, now flying at Brooklands.

Windermere.—Mr. Gnosspelius on hydro-monoplane doing good straights full mile in length, getting up and landing well.

Thursday, February 22nd.

Brooklands.—Mr. Pizey up with Capt. Broke-Smith. Flying stopped by wind and rain.

Eastchurch.—Only brief practice in early morning by naval and Territorial pupils.

The Plain.—M. Jullerot took Lieuts. Fielding and Ercole two flights each.

Friday, February 23rd.

Brooklands.—No flying. Wind and rain.

Eastchurch.—Naval and Territorial pupils out very early. Weather bad.

Saturday, February 24th.

Brooklands.—Mr. Fleming out with Bristol pupils. Capt. Allen alighted in Sewage Farm with monoplane after during several good flights. Pilot very little damaged, though machine turned over on him. Capt. Raleigh flying splendidly on biplane. Mr. Dashwood Lang, testing propeller-driven "wind-bus," took it up test hill from standing start in 11 2-5 secs, or 21.8 miles per hour—better than most cars. Record is 9 secs. on motor bicycle. Bristol-Lang propeller evidently highly efficient.

At Flanders School machine flying very strong. Mr. Kemp up for 25 mins. Green engine pulling splendidly, and evidently everything now quite right. Mr. Manning doing straight flights.

At Sopwith School Mr. Raynham flying well on Wright. Mr. Sopwith very busy carrying passengers, among them Admiral Buckman, Mr. and Mrs. Raikes, all delighted with experience. Mr. Howard Wright, well-known constructor, joined school as pupil, and took first lessons on Wright. Later up with Mr. Sopwith on 70 h.p. Blériot.

At Percival School Mr. Percival out flying well, as usual.

At Deperdussin School, brevêt machine now in fine trim. Mr. "Partridge" doing figures of 8. Capt. Massy, of Air Battalion, joined to learn monoplane, shaping well. Mr. Gill im-

proving wonderfully in straights. Mr. Petre and Signor Sabelli flying in good style.

Mr. G. de Havilland also came over from Farnborough on new "Factory" biplane with 60 h.p. (nominal) Renault engine. Brought Mr. Green—of "Factory"—over with him. Took 14 mins. over journey, not bad considering puffy wind. Machine very similar to one with Wolseley engine.

Mr. S. F. Cody arrived from Laffan's Plain on "Cathedral," and after some very pretty flying went home in evening, running into heavy clouds on way, and being compelled to cross Fox Hills at only 400 ft. Machine flying as well as ever, with 50 per cent. power to spare.

Barrhead.—Mrs. Lucking and Messrs. Walsh, Clinkskill, and Burk had Caledonia monoplane out, and got in a good day's rolling practice. All pupils show great improvement and aptitude in rolling, and expect to commence the straight flight stage next week. During the afternoon active instruction given by Mr. Philpott.

Brighton-Shoreham.—Lieut. Lawrence, exhibition flights on Blackburn monoplane. Collyer-England biplane giving good account of herself, and should prove excellent for school work, being wonderfully steady and responding well to controls.

Eastchurch.—Very busy day, all available machines in constant use. Sergeant Cutler, of Territorials, took certificate in fine flight, reaching 300 ft., officially observed by Mr. Frank McClean, Lieut. L'Estrange Malone, R.N., and Mr. J. L. Travers, the instructor. First Territorial to gain certificate at Eastchurch, but others well on way, and Sergeants Hedley, Hubbard, and Meredith may shortly be expected to qualify. Lieut. V. A. Barrington-Kennett down for day, and flew for last half of certificate on Short dual control machine in excellent manner, landing neatly. Lieut. L'Estrange Malone, R.N., who has been making straights for last few days, shows unusual skill for beginner, being notable for steadiness and well-managed landings.

Mr. Frank McClean, to whose generosity and energy whole of present forward state and activity at Eastchurch may be traced, visited aerodrome on Saturday and flew on Short 70-h.p. tractor biplane, which looked very fast when flying with other machines.

Perhaps most interesting flight of day was made by Commander Samson, R.N., who put new Short monoplane through official test by flying for an hour. Test entirely successful, new monoplane proving very fast and stable. No adjustments necessary, although machine was only turned out of workshops previous day. Commander Samson, during test, flew over Sheerness Harbour; time out and back, good 12 miles, was 11 mins. Therefore averaged 65 miles per hour in spite of fairly strong wind at altitude attained, of 1,400 ft.

M. Maurice Ducrocq, one of the best biplane pilots, who is largely interested in Nieuports in this country.

Mr. Fleming, the popular pilot, now flying the little Bristol Monoplane.

Mr. Jezzi put in good deal of flying, machine banking well at corners. Mr. Ogilvie also out in Wright.

Mr. F. B. Fowler made good flight on Blériot despite nasty gusty wind. Local interest increasing considerably. Over 100 people paid for admission to aerodrome, not to mention another 200 people with free "hedge tickets" in the road outside, and 50 or more motor cars belonging to the "nobility and gentry." Possible solution would be to post notices along outside of aerodrome:—"Ladies and gentlemen will be admitted, with or without motor cars, for the nominal sum of 1s. each, to help pay for the aviators' petrol and repairs. Others may witness the flying free of charge from the public highway."

Hendon.—At W. H. Ewen School pupils out all day practising. MM. Dubois and Baumann and Mr. Warren good, steady flights from 15 ft. to 30 ft. up, while Mr. E. H. Lawford got in good rolling practice and a few hops. During afternoon Mr. Ewen made nice flight of 20 mins. on Deperdussin, rising to 400 ft., and returning to the aerodrome with a fine spiral glide.

At A.S.L. School Mr. Ridley-Prentice out on Valkyrie racer, and later on the school machine. Hot sun on wet ground rendered air very tricky, and about noon flying ceased.

At Grahame-White School full day's work put in. Mr. Lewis Turner early took out biplane No. 2, and flew several circuits with Mr. Biard as passenger. Then made couple of test flights on biplane No. 1. Messrs. Biard and Gates out in turn on biplane No. 3, doing circuits. Mr. Fowler out on biplane No. 2, making several circuits.

Mr. Grahame-White during afternoon, for first time since return from America, out making many flights on biplane No. 2, on one occasion going over Mill Hill, Harrow, and surrounding country, after which he gave one of his inimitable exhibitions of banking and turning, various schools at aerodrome suspending operations in order to witness the demonstration. He then took in quick succession for passenger flights Mr. and Mrs. Douglas Gordon and Mr. Harold Arkwright.

Mr. Jutes and Mr. Turner both followed with solos on same machine, latter also with Mr. Baird in the passenger seat for instruction in right-hand turns. Meanwhile Mr. Ramsay on monoplane No. 4, showing great improvement after personal instruction from Mr. Grahame-White. Mr. Turner finishing day's work by flight of three circuits with passenger at 500 ft.

At Blériot School M. Pothet started rolling, and finding no wind to bother him, got up in air and did straight flights instead. Messrs. Morris, Hall and Clappen also out, improving in handling of machines. During one roll Mr. Hall got right off ground and flew about 150 or 200 yards without knowing it, and was quite surprised when told the reason why jolting had suddenly ceased. Mr. Prenssiel meanwhile aloft on brevêt machine for certificate. Flew first part in perfect style, and went up for second, but after a brace of 8's decided to discontinue as the engine appeared to be a trifle loose in frame.

The Plain.—M. Jullerot testing. Lieut. Harrison two solos in fine style. Mr. Jullerot taking Lieut. Fielding. Mr. Bendall with Lieut. Fielding as passenger.

In afternoon Lieut. Head two circuits in good style, Lieut. Ashton also out. Lieut. Head started for second part of certificate and passed, observed by Mr. Cockburn.

Windermere.—Mr. Gnosspelius, after one straight mile on hydro-monoplane, damaged rudder by touching mooring buoy on landing.

Rhyl.—Mr. Vivian Hewitt out on Bleriot and just starting out of aerodrome at 100 ft. when petrol pipe broke. Engine stopped and no room to turn back. Machine slid down tail first, pancaked, and then got on to proper gliding angle, proving, as Mr. Moorhouse did, that properly-balanced machine will find own angle. By this time only 30 ft. up, but after hitting one ditch and bouncing along very bad ground, machine pulled up at edge of another ditch absolutely undamaged. Rhyl becoming quite enthusiastic about aviation. Local Ratepayers' Association, in solemn council assembled, have arranged public dinner in honour of Mr. Hewitt, Messrs. Osborne, Thomas, Clewley and Councillors Phillips and Sykes being appointed to arrange same. *Rhyl Weekly News* making special feature of really accurate and well written accounts of Mr. Hewitt's flights. Always good when local men of substance and local Press support local enterprise. Compliments to all concerned.

Sunday, February 25th.

Brooklands.—Flanders School exceptionally busy. Mr. Kemp flying all day. First with Mr. Maurice Wright as passenger, then alone for greater part of day. Green engine apparently out to confirm victory in Alexander Competition, for never faltered once in several hours' flying. Mr. Kemp's turns very sharp for big fast monoplane, and whole performance remarkable for steadiness of machine and pilot. In evening Mr. Manning doing straight flights on same machine.

Sopwith School active as usual, Wright biplane at work all day. Mrs. R. F. Scott, well known sculptor and wife of Antarctic explorer, up as passenger with Mr. Sopwith. Mr. Howard Wright making remarkable progress on American rival's machine. Mr. Reilly, Captain Sykes, and other passengers on same with Mr. Raynham. Mr. Sopwith up with Admiral Buckman on Blériot, and later with Mr. R. Crewe on same machine at 1,500 ft. over surrounding country, doing several magnificent long glides, coming down in dusk and finishing day's work of the aerodrome by taking Mrs. C. G. Grey up on Wright over Byfleet way, skimming along track and performing prettily for considerable time.

Herbert Spencer School had very hard luck. After very good flying by Mr. Spencer, with new pupil, Mr. Lewis Marcus, Capt. H. E. Watkins took machine up for two circuits, and on descending ran into wash of another machine. Result that biplane dived and came down absolutely on end of skids, turning completely over as she struck and settling on upper plane. Capt. Watkins jumped at last moment, and came down on knee, breaking thigh at hip joint, but fortunately escaping being crushed by engine, a pure stroke of luck, as seat, legbars, and everything were smashed to splinters. Great sympathy expressed for Capt. Watkins, who bore his injuries like a stoic, and was perfectly conscious throughout. Everyone wishes him early recovery. Much sympathy also for Mr. Spencer, whose machine was one of the hardest worked and best fliers at Brooklands. He is a very capable constructor, and it is to be hoped that he will soon have new machine out.

Mr. Pizey and various Bristol pupils hard at work all afternoon, Capt. Allen, Capt. Raleigh, Lieut. Smith, Lieut. Longcroft, and Mr. Garne all flying well.

In early morning Mr. MacDonald out on *Vickers III.*

At Deperdussin School Mr. Petre, Mr. "Partridge," and Signor Sabelli very busy. Mr. "Partridge's" turns now becoming excellent and should take certificate whenever inclined.

Altogether splendid day's work, marred only by Capt. Watkins' accident. But really something should be done to keep crowd from flocking on to ground when flying is going on, and especially when an accident occurs.

Eastchurch.—Mr. Travers and Territorials in dead calm from 7 to 10 o'clock a.m., Sergt. Meredith making several very neat 8's. Then wind got up and further flying for beginners not considered advisable. Mr. Ogilvie then flying Wright in spite of wind with great steadiness, and going across country over island, not descending till noon. Wind must then have been blowing 35 m.p.h. above 100 ft. Afternoon again calm, Mr. Jezzi on biplane, taking Mr. Cooper as passenger.

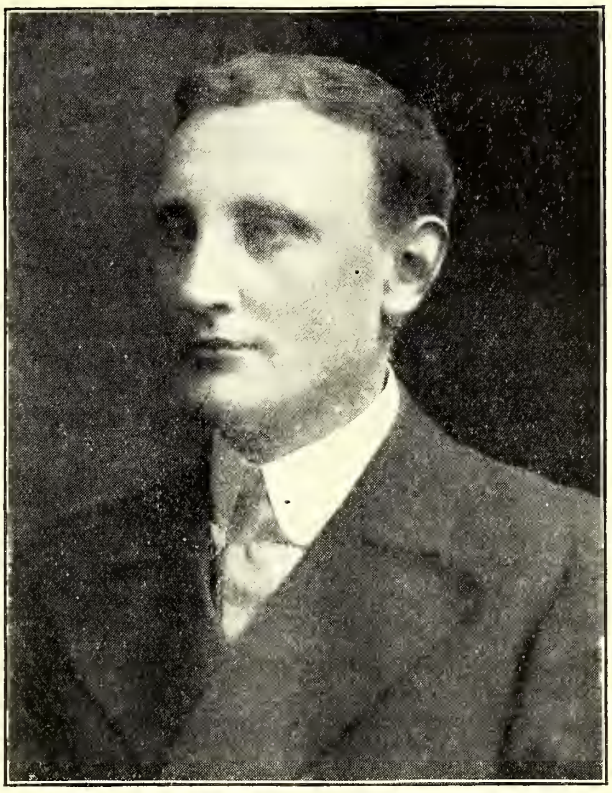
Hendon.—W. H. Ewen's pupils were out early, but wind bad for school work till afternoon, when great amount of practice was put in. MM. Baumann and Dubois and Mr. Lawford out on Blériot, showing splendid improvement. Mr. Ewen brought out Deperdussin, and after short trip handed her over to Capt. Loraine, who made beautiful little flight, banking steadily at turns and finishing with nice glide from 100 ft. Mr. Ewen then gave exhibition for benefit of visitors from Brooklands. Rising to 500 ft., he went up Edgware Road as far as Canons Park and circled back again by Millhill, finishing with splendid long glide from 400 ft. Capt. Loraine then up again flying with confident ease.

At A.S.L. School Mr. Barber out on Valkyrie racer in evening, and put up fine exhibition flight at 600 ft. or more, terminating with magnificent *vol plané*.

At Grahame-White School Mr. Grahame-White out on biplane No. 2 for extended flight in the direction of Edgware, finishing with magnificent spiral *vol plané* from 1,000 ft. Following this he took up Mr. Gates as passenger, who manipulated the control lever according to instructions, combination producing some characteristic evolutions, Mr. Maurice Ducrocq and Mr. Harry DeiaCombe being interested spectators of exhibitions.

M. Salmet on Blériot, in early morning, lost in fog, flew over Hampstead and Belsize Park, landed in Regents Park, turned out by keepers, and flew back safely.

Barrhead.—Mr. Walsh out on Caledonia doing short flights for first time. In afternoon Philpott out in rather tricky wind to test behaviour of machine under adverse conditions, and found monoplane quite steady, needing very little attention to the controls. Chassis ideal for aerodrome work, and though exceedingly rough landings have been made, nothing broken.



Mr. Damer Leslie Allen, a new Bleriot pilot.

New Blériot Pilots.

Mr. Damer Leslie Allen, who obtained his pilot's certificate last week at the Blériot School at Hendon, is a member of the Institute of Naval Architects, of the Institute of Naval Engineers, a Fellow of the Royal Colonial Institute, and holds a Board of Trade chief engineer's certificate. With such a record of activities, and being a practical aviator as well, he should be a useful man when the building of aeroplanes for the Navy is undertaken on a big scale.

Mr. Marcel Desoutter, who completed the tests for his certificate at the Blériot School at Hendon on the 17th inst., was the third pupil to qualify during the week. Mr. Desoutter, who was eighteen on the last day of January this year, has been flying consistently well, and is the thirteenth pupil of the school to obtain his certificate without any breakages whatever. He is at the moment the youngest certificated aviator in this country.

The First Hydro-Monoplane Flying.

The experiments made by Mr. Oscar Gnosspelius with his hydro-monoplane on Windermere have now been crowned with success, and he will now continue them *over* Windermere. On the 13th Mr. Gnosspelius was out again on his rebuilt monoplane, doing hops off the water, and on the 14th he had improved so much with practice that he was able to get nice straight flights out of the machine, leaving the water cleanly and "landing" quite gently. The short broad float, with a good aspect ratio, seems to operate well and to make less disturbance, both in getting off and landing, than do the longer and more boat-like type.

The machine thus captures the honour of being the first hydro-monoplane of normal type to fly properly, as well as being the first hydro-aeroplane of any type to leave British waters. She is actually the first hydro-monoplane, because the Paulhan-Fabre machine of a year ago was not really a success, and was a freak in many ways.

It is to be hoped that when the Navy really starts work in earnest Messrs. Wakefield and Gnosspelius, and the Lakes Flying Company generally, will not be left without their just rewards in the shape of orders for experimental machines.

On the 16th, the Lakes Flying Company's biplane had an accident, fortunately without serious results. Mr. Stanley Adams, after making a good flight with two 56-lb. weights in the passenger seat, and finding the machine lifted easily, took up Mr. E. W. Wakefield as passenger. When running quite slowly along the water the machine turned over nose first, possibly owing to the extra weight or to a novel type of tail with which experiments were being tried, the balance being very sensitive when on the water at low speeds. Very little damage was done, but, naturally, everything got wet and had to be overhauled and inspected.

During last week Mr. Gnosspelius was out on his hydro-monoplane, doing straight flights of about a mile in length, and on Saturday he did another straight, but on "landing" hit a buoy with his tail and bent a rudder bracket, and had to lay up for repairs. This machine now lifts with only half throttle, so it should do extremely well before long.

Work at Eastbourne.

The Aeroplane has recently had a visit from Mr. Victor Yates, of the Eastbourne Aerodrome, who has been making rapid progress as an aviator himself. The aerodrome in question belongs to Mr. Fowler, and is equipped with the machines which originally belonged to the Drexel and MacArdle School at Beaulieu. These comprise a 50-h.p. two-seater Blériot, a 50-h.p. single-seater Blériot, and three 25-h.p. Anzani-Blériots as taxis, so that evidently there is plenty of material for the pupils to work on. The aerodrome itself is quite close to the town of Eastbourne, the entrance being close to the tram-lines, so that it is very easy of access.

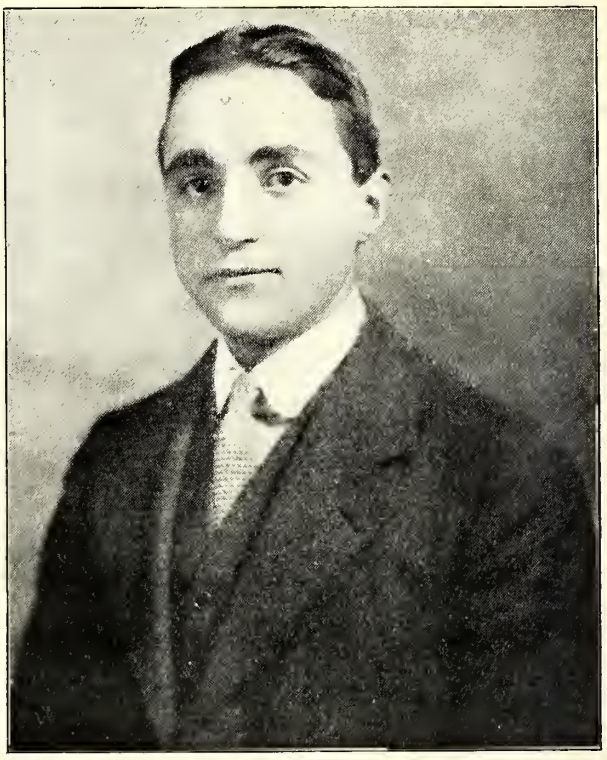
Since Mr. Fowler's involuntary bath in the Solent, both he and Mr. Yates have been doing a considerable amount of flying, Mr. Fowler having taken his certificate, and Mr. Yates being practically ready for his. Eastbourne, of course, is a charming place to stay at, and there should be quite good prospects for the school in the near future. Mr. Gassler, who will be remembered as one of the pupils at Hendon, has recently joined the Eastbourne Aerodrome, and is engaged on practical work, turning out a new type monoplane. Local people are taking quite a lively interest in the concern, and already a number of people have signified their intention of taking passenger trips as soon as the good flying weather arrives.

Shoreham to Eastbourne.

A very good flight was made by Mr. Walter Lawrence on his Blackburn on Monday this week from the Brighton-Shoreham Aerodrome to Eastbourne. He covered the distance in half an hour exactly, his Gnôme failing him just before reaching the Eastbourne Aerodrome, with the result that he was forced to land on the open beach, which he did without damaging any part of the machine. The flight speaks well for the Blackburn machine, and the landing speaks even better for the Blackburn chassis. Congratulations to Mr. Lawrence on his first big cross-country flight.

The Bristol in Spain.

The visit paid by Messrs. Busteed and Pixton, the two well-known Bristol pilots, to Madrid, has not only had an excellent effect in enlightening the Spanish military authorities as to the possibilities of British machines, but has resulted in Mr. Busteed, on the monoplane, winning the Avial Cup, presented by the Spanish Aero Club for a flight across Madrid and back. It is to be hoped that this is only the first of a series of victories for British machines on the Continent, for there is nothing like carrying the war into the enemy's country to produce a good moral effect at home.



M. Marcel Desoutter, the youngest certificated aviator in England.

Mr. Gordon Bell's Escape.

Writing from Buc, Mr. Gordon Bell, in a sympathetic letter on Mr. Gilmour's accident, expresses the feeling of everyone acquainted with the machine by saying, "I cannot imagine anything breaking on the Handasyde." He adds, "I nearly had the same thing the other day. One of the under wing stays broke at over 2,000 ft. The wing went all shapes at once, but I managed to land safely at St. Cyr without breakage. I know now what it is to have 'cold feet.'" Mr. Bell is to be sincerely congratulated on having escaped a horrible smash, and it is only to be hoped that after this lesson he will refuse to fly any machine in which the wing stays are not doubled, as Mr. Gilmour always insisted on having them in his machines. After the accidents to Capt. Camine and Lieut. de Grailly one would have thought that the wing stays, at any rate, on the R.E.P.'s would have been past any possibility of breakage.

The Royal Aero Club.

The Annual General Meeting will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

The retiring members of the Committee are: Ernest C. Bucknall, Col. J. E. Capper, C.B., R.E., G. B. Cockburn, E. Manville, J. T. C. Moore-Brabazon, Sir Charles D. Rose, Bart, M.P., A. Mortimer Singer, Hon. A. Stanley, M.P.; R. W. Wallace, K.C.

Thursday, March 7th, is the last day for the receipt of nominations. The following members have so far been nominated: *Ernest C. Bucknall, *G. B. Cockburn, Harry Delacombe, Capt. J. D. B. Fulton, R.F.A., Major F. Lindsay Lloyd, Fred May, *J. T. C. Moore-Brabazon, Norman Clark Neill, *A. Mortimer Singer. (The names marked with an asterisk are those of members of the present Committee.)

The following Aviators' Certificates were granted: (183) Damer Leslie Allen (Blériot monoplane, Hendon); (184) Sydney Parr (Blériot monoplane, Hendon); (185) Lieut. Bertram Richard White Beor, R.F.A. (Bristol biplane, Salisbury).

For the Mortimer Singer Prize, on the 14th inst., Lieut. B. H. Barrington-Kennett made a flight of 249 miles 840 yards, observed by Capt. J. D. B. Fulton, R.F.A., and Capt. E. B. Loraine. This constitutes a world's record. The Royal Aero Club has applied to the Federation to have this record officially recognised.

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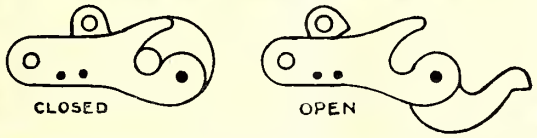

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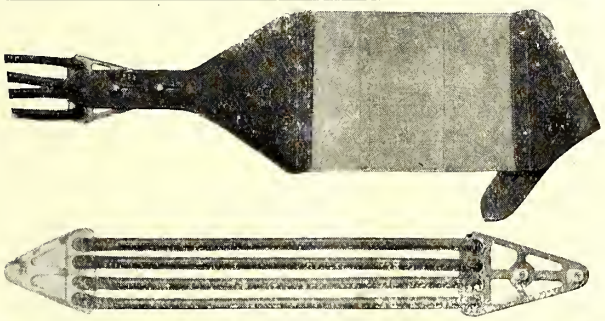

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The Latest Avro.

There are many points of interest in the latest "Avro" biplane which has recently arrived at Brooklands, and is probably flying by the time these notes appear. In general design it is of the usual "Avro" type, but has a square fuselage. The construction is really massive, and the workmanship is in keeping.

The planes have the Phillips entry, which is now being adopted by the leading Continental firms, and the underside of the trailing edge is horizontal when flying. Arrangement is made so that the planes can be removed and monoplane wings attached, as was done last year on another Avro.

The warping hinges are practically doubled, thus obviating any chance of breakage, and the struts are riveted in welded steel sockets fixed to eyebolts by bolt and split pin. The warping pulleys are arranged through transverse slots in long sockets, to reduce head resistance.

The fuselage is of square section, and deep, so that only the pilot and passenger's heads project through the padded openings at top. The bottom of the fuselage is below the level of the lower plane, and thus the tractor draught has a free run aft. The body can be divided in halves on the usual "Avro" system to facilitate transport. The bottom of the fuselage is fitted with non-inflammable celluloid windows. Access to the engine is easy, owing to the aluminium covering of the nose being quickly detachable.

The chassis is of steel tubes connected to a laminated steel spring, at the ends of which are attached two dished steel wheels, fixed to the spring by an "Avro" patented system. There is a central skid with rubber cushions at the strut attachments.

The tail has an all-steel frame and is non-lifting; there is no fixed vertical surface, and the operating levers are hollow and made from sheet steel.

The control is by universal levers, operated by either the pilot or the passenger. Elevator and rudder wires are inside the body. All nuts are fixed by split pins, and all up-wires in the planes are duplicated. Altogether the machine looks a strong, sound job.

For Fittings and Accessories.

A new firm to claim the attention of aeroplane manufacturers and experimenters is the Aeronautical Accessories Manufacturing and Supply Syndicate, of 54, Audley Road, Hendon, which is close to the London Aerodrome. This firm, which has associated with it a gentleman of considerable experience in the scientific side of aviation, has set out as actual manufacturers of wire strainers, eyebolts, wire clamps, and all screwed parts used in aeroplane construction, and has no intention of being simply a factor of goods made by someone else. Goods can therefore be bought at manufacturing prices. Full stocks are held of standard goods, and as the works are largely engaged on other operations which call for exceedingly neat and accurate workmanship, one can have full confidence in recommending anything turned out there.

Mr. DelaCombe Moves.

At the period of the "Circuit of Britain," last year, Mr. Harry DelaCombe, who was in charge of the Bristol control for the Royal Aero Club, arranged with the British and Colonial Aeroplane Co., Ltd., to join them for a period as "flying manager." That period having elapsed, Mr. DelaCombe is now in negotiation with certain firms in a matter which is likely to have considerable effect on the development of aviation in this country. Mr. DelaCombe's intimate knowledge of, and considerable influence in both the Navy and Army, have undoubtedly been most useful, and so has his considerable organising ability, as is evident when one considers the number of Service men who have joined the Bristol schools in the past few months. It is to be hoped that under his new arrangements Mr. DelaCombe will be able to use his undoubted talents still more for the good of the country and the development of aviation.

An Historic Catalogue.

One of the most gorgeous productions yet seen in connection with aviation is the new Blériot catalogue, which contains sixteen pages of exquisitely produced photographs of Blériot machines in various phases of their activities. There is a regular dissertation on the suitability of the Blériot for military work, the printing is wholly excellent, and the reading matter is distinctly readable, which catalogues in most businesses are not, and the English, for which, presumably, M. Norbert Chereau and Mr. L. Seymour Metford are jointly responsible, is quite literary, and free from the stock phrases of the shopman. It is distinctly a production to be obtained and kept as a souvenir of the progress of aviation.

Developments in Scotland.

The Scottish Aviation Co., who are now getting to work steadily at Barrhead, have mapped out quite a useful programme for the coming year. The tuition fee, either on monoplanes or biplanes, has been fixed at a very low figure, and includes insurance against breakages. In addition a £5 prize is offered to all pupils doing a flight of thirty minutes' duration within a week of passing for their certificates.

Besides ordinary tuition work the firm is manufacturing Caledonia monoplanes, complete with 28-32-h.p. engines, and it is their intention to sell these for £275 complete, including tuition. Caledonia-Avro biplanes will also be built under licence from A. V. Roe and Co., and these are to be sold at £500 with 30-h.p. engine, including tuition. The firm's facilities for building are good, and they claim to turn out the highest class workmanship, particular attention being given to detail. The reason that such low prices are quoted is that certain orders now being negotiated will enable the firm to standardise their parts and thus cheapen production. All machines turned out by the firm are guaranteed, and are to be demonstrated by flying a considerable distance before delivery. Workmen of the best class are, of course, obtainable in the Glasgow district, and there does not seem any reason why, with local encouragement, the firm's enterprise should not be a distinct success.

The Use of Steel Tube.

Some little time ago it was remarked in The Aeroplane that there was a rapidly increasing inclination to use steel tube in the construction of aeroplanes of all types. At present in this country steel tube is chiefly used for the forks and radius rods for landing wheels, for extension struts, and for details in the chassis and controls. In France, however, steel tube is now being used very largely for the whole chassis, the Morane-Saulnier, one of the best designed and constructed of French machines, using stream-line steel tubing throughout in the chassis. Tubing has certainly very considerable advantages in some ways for such work, for though it may not stand bending to the same extent as wood before breaking, it will stand considerably bigger loads before it bends at all, and when it does go it is impossible for it to splinter. Consequently, it should be eminently suitable for such things as chassis struts, and the uprights of biplanes, even where wooden longitudinals are used in the fuselage and wooden spars are used in the wings. Of all firms in England turning out steel tubing none do it better than Accles and Pollock, of Oldbury. This firm has always been in the front rank for quality, and the writer's experience of the material both for cycle and motor work has been eminently satisfactory. A speciality is made of tubes of all sorts of sections, stream-line and box sections being quite in the run of their everyday work.

From "The Field."

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[N.B.—The Editor regrets that, owing to pressure on space, much interesting correspondence has had to be held over.]

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PARTNER WANTED to develop New Design Model Aero Motor. Full particulars, Box 423, c/o THE AEROPLANE, 166, Piccadilly.

Useful Model Work.

MODEL PLANES (*continued*).

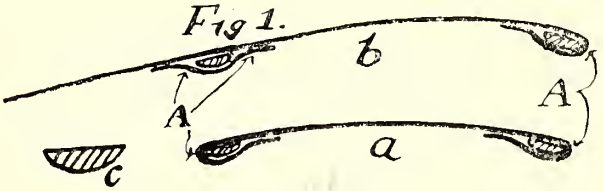
The second method, the distinguishing point of which is the use of ribs of sheet-tin, will need slightly different construction according to the spars used. These latter can be made of wood, of piano-wire, or of aluminium tube.

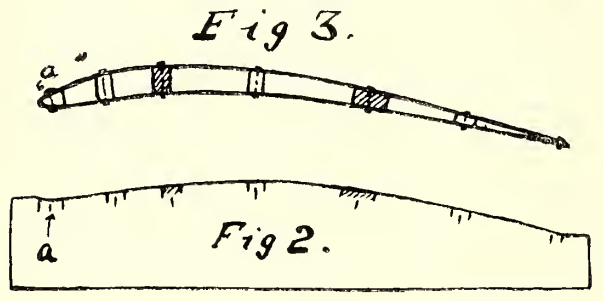
Fig. 1 shows two typical ribs, built on wood spars, *a* being with a stiff trailing edge, *b* with a flexible trailing edge. The ribs are cut longer than required, and from 1-16 in. to ⅜ in. wide, according to chord. The ends are doubled over and soldered, the loop being large enough to slip along the spar. When in their proper positions they are fixed firmly, the method of fixing depending on the spars used. If the latter are of wood (they should be shaped as in *c* and tapered towards the ends), the ends of the loops I are nipped tight with pliers, so as to give a "bite" on the spar. If of piano-wire, the ribs should be fixed with a touch of solder. If of tubing, a hole must be drilled through spar and rib from top to bottom, and a "pin" of wire pushed in and the ends bent over. If the plane is square-tipped, the end rib should be made rather wider than the rest.

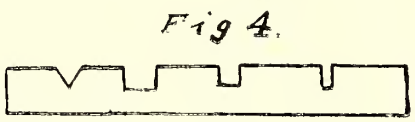
Wire for spars should be bought in straight lengths, as used in cycle spokes: it is hopeless to try and straighten it if it has been coiled.

The third method gives probably the best results, if clever fingers are at work; but, as pointed out above, the latter are a necessity.

As in the first method, jigs are necessary for each rib if the ribs are of different chord. It is best to make two jigs. Fig. 2 shows the first, Fig. 3 being the desired plane section. The jig consists of a piece of ⅜ in. or ¼ in. timber, cut out with a fretsaw to the *under* side of the desired camber. On the edge are marked the positions of the spars and distance-pieces.







The second jig (Fig. 4) is simply a piece of wood or sheet metal, on the edge of which are cut gauge slots showing the thicknesses required for the various distance-pieces.

The materials required are:—Sheet celluloid for top and bottom laths; sheet cork for distance-pieces; timber for spars, and fine brads ("Veneer pins") for fixing.

The celluloid should be about twenty- to forty-thousandths thick, and should be cut into strips about 3-16 in. to ⅜ in. wide, according to size of plane. It is bent double in the centre (to form the leading edge), and a cork distancer, cut to a triangular shape and inserted at the bend. The embryo rib is then laid on the jig, and a pin driven through at *a*, into the jig, which should be held in a vice. Then the second distancer should be laid on the lower "lath," the upper lath held down on to it, and another pin driven through. Next, the main spar is dealt with similarly, care being taken that the rib is in its correct position on the spar. This procedure is continued till the trailing edge is reached. The best way to deal with the latter is to run a strip of celluloid right along it, which makes a nice rigid fixing for the fabric without making the edge itself too stiff.

Two handy little tips for building are the following:—(1) The only way to cut cork accurately is to use a sharp knife wetted with water, or, preferably, soap and water. (2) It will be found best to drill holes through the top lath which will just take the pins. The latter should then be *pushed* through the cork or the wood of the spars, and given a tap or two to take them through the under lath.

When the rib is finished, it must be carefully prised off the jig to which it has been attached by the pins being driven *into* the jig. The ends of pins are cut off with pliers, and carefully riveted over with a light hammer, after which the distancers and spars are painted with glue to harden them and prevent the pins drawing out.

When the whole plane has been assembled, the two spars must have diagonal stays (of thread for choice) run between them, to prevent the ribs twisting.

(*To be continued.*)

MODEL CORRESPONDENCE.

(*Correspondents are reminded that space in these columns is strictly limited, and are therefore requested to make their communications as terse as possible.*)

Sir,—I have read with great interest the various letters which have appeared in your excellent journal re the failure of the Model Aero Club movement.

During my brief membership of two seasons with the Scottish Aeronautical Society Model Aero Club I have seen many ups and downs as regards the management, and as hon. assistant secretary at the present time I ask your kind indulgence that I may air my views, which I trust will be of use to anyone who intends starting a model aero club.

When our club started in September, 1910, we had a membership of about 40, of which there were only about half a dozen who really cared for model flying. The first competition, held in October of the same year, was an absolute farce, being held in a hall about 50 yards long. From this time onwards nothing practical was done by the club as a body, though the faithful half-dozen stuck to their guns, or rather models. There were also a few lectures, but the secretary did not think it necessary to advertise them or advise all the members. General meetings there were in plenty, and at these there seemed to be only two persons in prominence, the chairman and secretary, who seemed to delight in slanging each other.

This state of affairs continued until February of 1911, when one timid young fellow, who shall be nameless, stood up and asked if this were really a model aeroplane or dirigible (*i.e.*, gasbag) club, and could not anything be done by the members' models instead of with their tongues. This was really the turning point of the club's career, and a few of the ordinary members arranged a flying meeting which brought the faithful half-dozen together. Bi-monthly meetings were arranged, then weekly meetings, all of which have proved a great success.

Needless to say, the useless and hindering office-bearers left the club, or were asked to resign, and the club has now a total membership of fourteen, all of whom are workers who have the good of the club at heart.

The club suffered a great loss when the parent body thought fit to dispense with the workshop, presumably because the members of the Scottish Aeronautical Society did not take full advantage of it, though the model-making members were constantly there. Naturally, this has hurt the membership of the Model Club greatly, but negotiations are in hand to remedy this matter.

It is surprising the lack of interest in aviation in the Glasgow district, with its almost a million population. In Govan an effort was made to raise a club, but it seems to have fallen through, no doubt due to the lack of effort on the part of the organisers. It is said that the secretary is the backbone of a club, and I believe from experience in different sports clubs that there is a great deal of truth here. Also I would strongly recommend an actual worker in models for the post, not merely a half-interested member.

I must agree with your recent remark that competitions held on the usual lines are absolutely worthless. Instead of

having the usual distance and duration competitions every Saturday, I would suggest that clubs try models rising from the ground, hydro-aeroplanes, tractor models, scientific kite-flying, model gliding; and as regards rating for models to put a restriction on the amount of elastic for a given fuselage length.

In conclusion, I am certain that the model aero club movement is growing steadily but surely, judging from the large number of reports in The Aeroplane every week. Wishing The Aeroplane every success for the future,

John Smith Gordon,
Hon. Asst. Sec., S.A.S. Model Aero Club.

Sir,—With reference to the letter by Messrs. Mann and Grimmer published in a recent issue, I should like to say that Mr. Tivy got the details of Mann propellers from a pair in my possession. I bought them last autumn as "similar to those used on the record-breaking Mann monoplane." The propellers are 8 in. in diameter and have absolutely flat blades about 1½ in. across. The blade angle is very large, being about 39 degrees at the tip. If these are not the characteristics of the Mann propellers, then I should like to ask why they were advertised and sold as such.

Considering the blade of a propeller as an aeroplane (the tip, at 600 revs., travels about 14 m.p.h.), then I should like to know if Mr. Grimmer considers that at such low speeds flat planes with an aspect ratio of 2½ to 1 are "the most efficient in the world."

Cambridge. R. T. M. Haines.

CLUB NOTICES.

N.B.—Club Notes must be posted to 166, Piccadilly, to arrive not later than first post Monday morning, and should be as brief as possible.

Ealing and District Aero Club.—On 21st. Proposals read with regard to (1) club library, (2) gliding, (3) lectures, and (4) competition. Proposal Paddington Club for inter-club contest taken up. Saturday, 24th, competition for juniors for wrist watch held. Winner, K. Grierson; second, G. Beeching; L. Roche also flew.—B. J. Kirchner, Hon. Sec., 1, Queen's Gardens, Ealing, W.

Coventry Aeroplane Building Society.—Exhibition of petrol-driven, scale, and other models, parts of full-sized machines and apparatus, in Corn Exchange, March 30th. To be opened 3 p.m. by Mayor of Coventry (Colonel W. V. Wyley). Address by Rear-Admiral R. H. S. Bacon, C.V.O., B.S.O., of Coventry Ordnance Works. Music. Mr. W. A. Weaver has offered prize of 10s. for best model shown by amateur (not member of Society). Entrance fee, 1s. Entries close March 16th. Co-operation of other clubs invited. Admission 3d.—J. W. Schofield, Hon., Sec., 22, Kingston Road, Earlsdon.

Blackheath Aero Club.—Saturday last general meeting at Central Hall. Mr. H. H. Groves in chair. Officers elected: President, Mr. C. E. Rippon; vice-president, Mr. B. Woollard; committee, Messrs. A. B. Clark, H. Coomber, J. H. Dollittle, H. H. Groves, F. Plummer. New rules read and "club records" passed. Distance, 2,265 ft.; duration, 61 secs.; and distance for models rising from the ground, 762 ft. All these held by Mr. Clark. Flying at Kidbrooke, Blackheath and Lee by Messrs. Brown, Dollittle, Whitworth, F. M. Bailey, F. G. Peter, C. B. Holland, A. E. Woollard, H. H. Pizey, W. H. Egelstaff, E. Hoch, and A. M. Jarvis. Particulars of future events from Mr. A. E. Woollard, Hon. Sec., 48, Halton Road, Catford, S.E.

Manchester Model Aero Club (40, Bignor Street, Cheetham).—Model flying meeting held Trafford Park Aerodrome (near golf links), Saturday afternoon, March 2nd, at 3 p.m.—Kenmure Kinna, Hon. Sec.

Brighton and District Aero Model Club.—Good flying, Shoreham, 24th. Air seemed full of unexpected currents which made straight flights almost impossible. Behaviour of some models was extraordinary. One small model rose to immense height on up current and then dropped suddenly for matter of 20ft. This current seemed to be fixture, for performance was several times repeated. Flying as usual next Saturday. Communications to Hon. Sec., A. von Wichmann, "Kingsleigh," Kingsway, Hove.

Hackney and District Aero Club.—Meeting Saturday. Flying by Messrs. Gittus, Marmin, Potts, P. Hurlin and Field. Illuminated flights at close. Flying next Saturday as usual. General meeting to be called soon.—B. H. Longstaffe, Hon. Sec.

St. Mary's Model Aero Club.—Saturday, Messrs. C. Restall, Eburne, Robbins, Harper flying. Next business meeting March 13th at 8.30 p.m.—H. W. A. Johnson, Hon. Sec.

Reigate, Redhill and District Aero Club.—Earlswood, Saturday, 24th, R. Wilson, May and Lewis out. Sunday, May and Lewis flying. Competition and certificate flights next Saturday, Earlswood, 2 p.m.—H. V. May, Hon. Sec.

Birmingham Aero Club.—At Billesley Farm, E. Trykle, 48 secs., G. Wilde, 44 secs., with Trkyle type model. W. Lunn, M. Vale, G. Baker, and G. Mason also flying. Competition for W. H. C. monoplane Saturday next, March 2nd, by juniors; duration. Usual monthly meeting, Bell Inn, Phillips Street, 8 p.m., March 4th. Club business, etc.—G. Haddon Wood, Joint Hon. Sec., 8, Frederick Road, Edgebaston.

Paddington and Districts Aero Club (1910).—Saturday, March 2nd, Mr. Canning's lecture, "Position of planes: their relation to stability," Workshop, 8 p.m. Lectures every Saturday during winter. Inter-club contest with Ealing, April 6th, at Parkside. Competitions for juniors, March 23rd. Result of workshop competition:—1, Mr. Woolley; 2, Cannell; 3, Canning; 4, Carter. Mr. Davies, of Twinings, and Mr. Hurlin, of W. H. Co., judging.—Hon. Sec., W. E. Evans, 133, Buchanan Gardens, Harlesden, N.W.

Aero Models Association (N. Branch).—Finchley, Saturday last, Messrs. Hindsley, Corder, Root and Partridge flying. Members are asked to turn up Saturday next at Viver's Farm, Bishop's Avenue, East Finchley, N., 3 p.m., for duration competition. Entrance 3d. Distance competition, March 16th, at 3 p.m. Competition open.—Malcolm B. Ross, Sec., 15, Highgate Avenue, N.

Bristol Model Flying.—Meeting, Feb. 24th. Flying by Messrs. Keyte, Pearce and Howse. Next meeting March 2nd, Sea Walls, 3 p.m. "Self-rising" models particularly invited.—R. V. Tivy, Sec., 3, Royal York Crescent, Clifton, Bristol.

Dover and District Model Ae. Club.—Meeting held Saturday, 24th, Messrs. H. D. Davis, H. E. Whorwell, R. C. Wilson, H. T. Holman and J. Clark flying. Meets every Wednesday and Saturday at 2.30 p.m., at Northfall Meadow, near Castle. More members are urgently wanted.—Ronald C. Wilson, Asst. Sec.

MODEL ADVERTISEMENTS.

THE Ideal Motor for the Model builder is the Ideal Model Turbine. Weight ¾lb ¼ h.p. at 2,000 r.p.m. Lists, stamp.—S. Summerfield and Co., Melton Mowbray.

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NEW CATALOGUE of Model Aeroplane Accessories now ready.—J. Bonn and Co., Ltd., 97, New Oxford Street, London, W.C.

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THE FIRST CUSTOMER whose order for instructions and scale drawings is opened on Wednesday, March 6, will receive gratis a complete "Mann" Monoplane, exactly as listed at 18s. Last week we returned 3s. 6d. to Mr. Leadbeater, 38, Hurlingham Road, London, S.W.; 2s. to Mr. Hussey, 100, Crawford Street, London, W.; and 1s. 6d. to Mr. Burrell, Clifton Road, Newcastle-on-Tyne.

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THE AEROPLANE

1D WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

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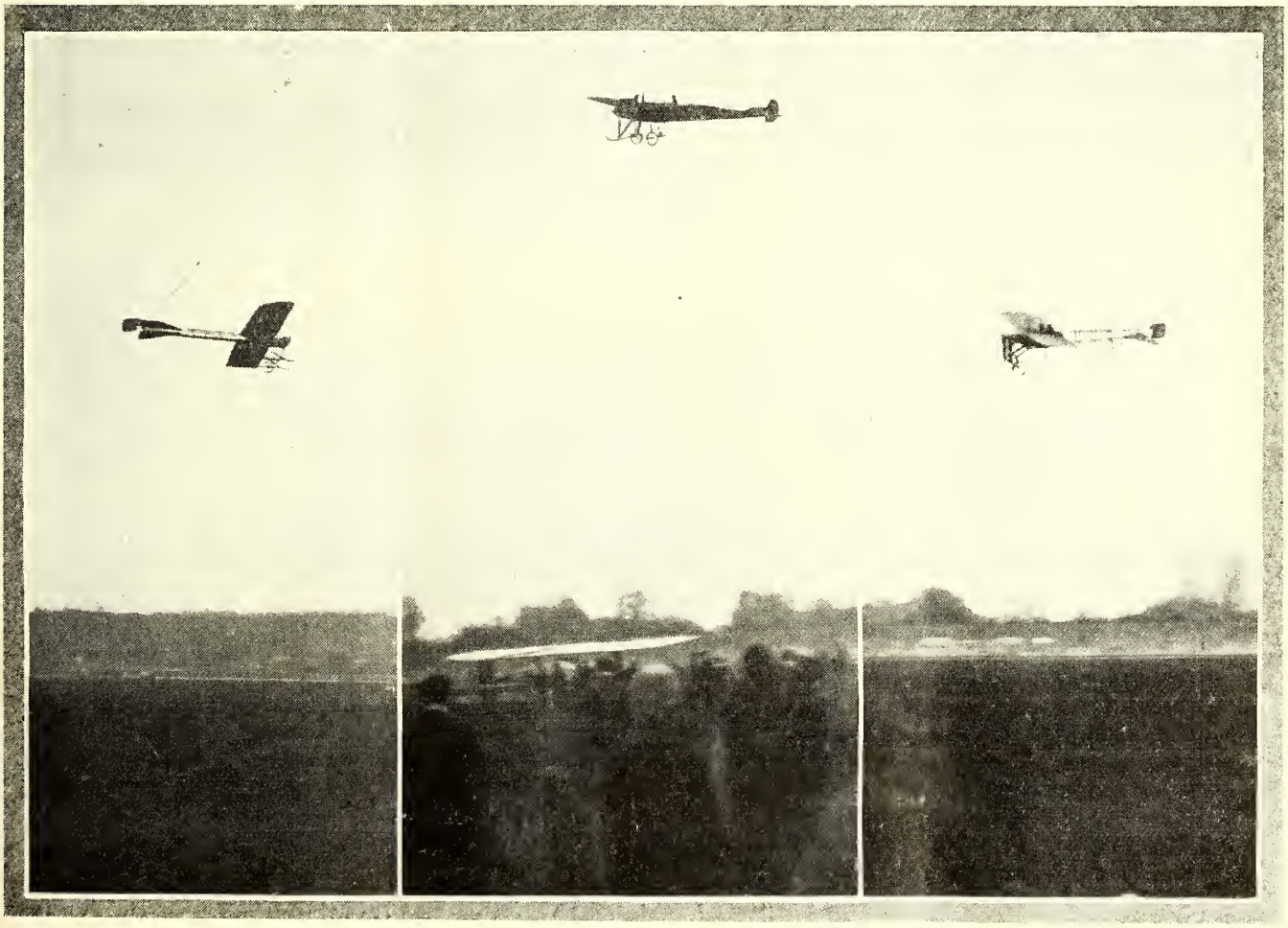
OUR AVIATORS AT WORK.



Photographs at Brooklands on Saturday, February 25th. Left to right—Signor Giovanni Sabelli on the Deperdussin; Mr. Ronald Kemp on the Flanders; and Mr. T. O. M. Sopwith with Admiral Bucknam as passenger on the Bleriot.

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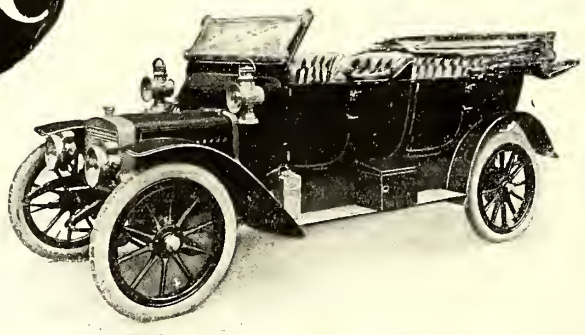

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MATTERS OF MOMENT.

THE AIR CORPS.

In this issue will be found an article by Mr. Whittaker analysing the Army Estimates in their relation to military aviation.

So far as the Estimates are concerned it rather appears that the Army Aircraft Factory and the combined Naval and Military Aviation School are considered as the be-all and end-all of military aviation, but the really interesting question is what number and what type of aeroplanes are going to be bought for actual use in warfare, for obviously the ordinary school machines on which officers will be taught to fly should not be precisely the machines which will be used on active service.

It is true that in Tripoli the Italians have been using box kites of an antique design, but it must be remembered that where all are blind the one-eyed man is king, and where the enemy have no aeroplanes the box kite is an instrument of considerable value. Still, the slow biplane, whether engine-behind or otherwise, cannot be of the slightest use in actual warfare against a Power equipped with modern machines.

The engine-behind machine certainly should not be allowed a place in any army, but biplanes with the engine in front can be made practically as fast as monoplanes, and slower machines of the same type make excellent school machines. In fact, an aviator trained on a modern biplane could practically take to the fastest monoplane without extra training and with very little practice.

Lord Haldane's Memorandum states that the Estimates provided for "a considerable number of aeroplanes as the first instalment of the equipment of the Field Army," but, unfortunately, the Estimates themselves do not indicate in the least what sum is to be spent in this way. Presumably they are all to be provided from the sum of £126,900 allowed in the Estimates for "stores and materials," so that presumably the aeroplanes will be bought and charged to the Factory as "stores," though no indication is given as to what aeroplanes are to be turned out by the Factory and what are to be bought from independent manufacturers.

Further, the wording of the Memorandum quoted seems to indicate that only a "first instalment" of aeroplanes is to be bought out of this year's Estimates, and the real equipment of the Field Army is to wait till next year, which, of course, would be not only absurd but dangerous.

Among the other points which it is hoped will be elucidated in the Debate on the Estimates, apart from those mentioned by Mr. Whittaker, is the exact reason for spending £15,000 on a dirigible shed, considering that a wholly excellent shed, far too big to house any dirigible of reasonable size for use in modern war, was erected by the *Daily Mail* at a cost of £5,000 on Wormwood Scrubs something like a year before its solitary inmate the Clement-Bayard ever put in an appearance.

It will still be more interesting to know how the sum of £7,300 was spent on the extension of a "small shed" for dirigibles, more especially as the Estimates tell us that the original price last year for this work was £6,000, and that a further £1,300 has been added with Treasury sanction. Also the little item of £4,000 for the Aircraft Factory office may be worth explaining, considering what an extremely fine building could be erected for this price if it were done as an ordinary business proposition.

On the subject of these dirigible sheds it will be interesting to find out what has been done with the Clement-Bayard itself, and whether the public has had, or is ever likely to have, any value for the £12,000 or so spent on this machine. Also whether the Lebaudy machine is still occupying space in the Government sheds at Farnborough, and if so, why?

While on the subject of military aeroplanes it may be interesting to draw attention to the statement of Col. Seely, in reply to Mr. G. J. Sandys on February 27th, that Germany, presumably according to the information of our Intelligence Department, possesses 30 aeroplanes. The writer has it on the authority of a friend who has recently returned from Germany, and who has been through the Rumpler works within the past fortnight, that that one firm has at present 68 aeroplanes on order for the German Government.

Incidentally, the Rumpler-Etrich two-seater is capable of a speed very close on 80 miles an hour with a 120-h.p. engine, and there certainly is not a machine at the present moment in this country to touch it, and it is very doubtful whether even in France there is anything better. The Rumpler firm, however, has not a monopoly of the military orders, for the Aviatik, Harlan and Grade are all practically as much in favour with the German Government.

The writer happens to know that there are, fortunately, several British constructors whose latest designed speeds approach very closely that of the Etrich, and may possibly even surpass it, but they must be convinced that the War Office seriously intend to buy machines instead of, as the Estimates appear to indicate, merely purchasing a few machines to stifle public opinion, and trusting to the Aircraft Factory for the bulk of the output.

However, one may rest assured that all Colonel Seely and the "progressive" party in the War Office can do for the good of military aviation, and for the good of British constructors, will be done, and it is also satisfactory to know that aviation has in Mr. Joynson Hicks, M.P., and Mr. G. J. Sandys, M.P., two men of very great influence who are practically devoting themselves to the subject of military aviation, realising as they do that in an adequate Air Corps lies the safety of this country.

BRITISH ENGINES AND WAR-PLANES.

A point worthy of particular note in the Government scheme is that no encouragement whatever is given to the makers of British engines. Certain aeroplane makers who have been asked to quote for war-planes have quoted with British engines of proved capacity. They have been instructed to revise their quotations to include French engines of known inferior capacity. Now, it is obvious to any sane man that this is a suicidal policy for the War Office to adopt. We know we can make aeroplanes in this country as good as, if not better than, any in France, and our workmanship and material are admittedly better. But any good designer can, with the help of a blacksmith and three or four carpenters, turn out an aeroplane in six weeks or so.

On the other hand, no matter how clever the designer, or how good his works equipment, it is impossible to turn out a new engine in less than six months, and it generally takes a year. Consequently, if war broke out to-morrow and the supply of French engines stopped, we should find ourselves in a couple of months' time with plenty of aeroplanes but no engines, for those British engine-makers who have produced good engines are so discouraged by the treatment they have received that they are merely making one or two engines now and then for experiments.

We have the engine-makers in the country, if they were encouraged, as is proved by the splendid performance of the Green engine in the Alexander £1,000 Prize Competition, when the test engine ran for 26 hours 7 minutes without a misfire, and gave 62 h.p. on less petrol than is consumed by a French Gnôme, which gives only a little over 40 h.p.

Other makers, such as the N.E.C., E.N.V., J.A.P., Wolseley, etc., can do equally good work if they receive encouragement, and encouragement they must have, for their immediate development is, if possible, even more important than that of the aeroplane makers.

THE "ULTRAMARINES."

Colonel Seely's statement in the House of Commons on Monday last is likely to cause more than a little heart-burning among Service men who are really keen on aviation. The statement was made too late for it to have full consideration this week, but it shall be handled without gloves next week. The outstanding point, however, is the extraordinary formation of this new Air Corps, composed as it is of soldiers, sailors, and civilians, apparently mixed up in an indescribable *omnium-gatherum*, in which, after passing from the combination School on Salisbury Plain, a soldier may become a sailor, or a civilian a soldier, or both may become either, so that, to quote Colonel Seely, "In a purely land war the whole flying corps will be available, and in a purely naval war the whole flying corps will be available for naval war."

One always thought that the individual member of the Royal Regiment of Marines, "His Majesty's Jolly, soldier and sailor too," as Mr. Kipling calls him, represented about the limit of versatility, but he will be a mere person of one idea compared with the new civilian-soldier-aviator-sailor, the Ultra-Terra-Marine, the "Super-Jolly" of the new regime.

If this wonderful organisation is merely the development of the "fourth arm" it seems preordained to damnation by everyone concerned, but if, as there seems just a chance, it is the protoplasm of a Third Service, which is to be neither Navy nor Army, but a distinct and self-governing organisation, there is some possibility of its success in the dim future.

But in the meantime let us pity the officer who has to sink his pride in his own Service and become a member of a nebulous and indeterminate corps which will probably be popularly known as the Ultramarines. One can foresee the question and answer of the future whenever a Service aviator arrives unexpectedly:

"Where did you come from, baby dear?"
"Out of the Everywhere into here."

By Parachute from an Aeroplane.

Wonders never cease, and the American imagination is an ever-ready help to prevent the unfortunate demise of miracles. In the United States it is an axiom of life to believe nothing you hear and only half of what you see. Bearing this in mind, the latest news from St. Louis is of interest. One "Captain" Berry has made a descent from an aeroplane by parachute. He accompanied a Mr. Jannus on a biplane to a height of 1,500 ft., when, after the latter gentleman, who was acting as pilot, had "steadied the machine," to quote the daily Press, the gallant "captain" let himself down through a hole in the lower plane, and grasping the rings of the parachute, cut himself adrift. According to report, he floated safely to the ground amidst the plaudits of an assembled multitude. He says that he fell over 300 ft. before the parachute opened.

Though not precisely a feat to be imitated, the performance certainly marks a certain step in the development of aviation, for it is the first time a man has quitted an aeroplane in mid air and survived.

Commander Samson, R.N., starting out on the new Short monoplane. Note the crew of bluejackets holding back the machine.

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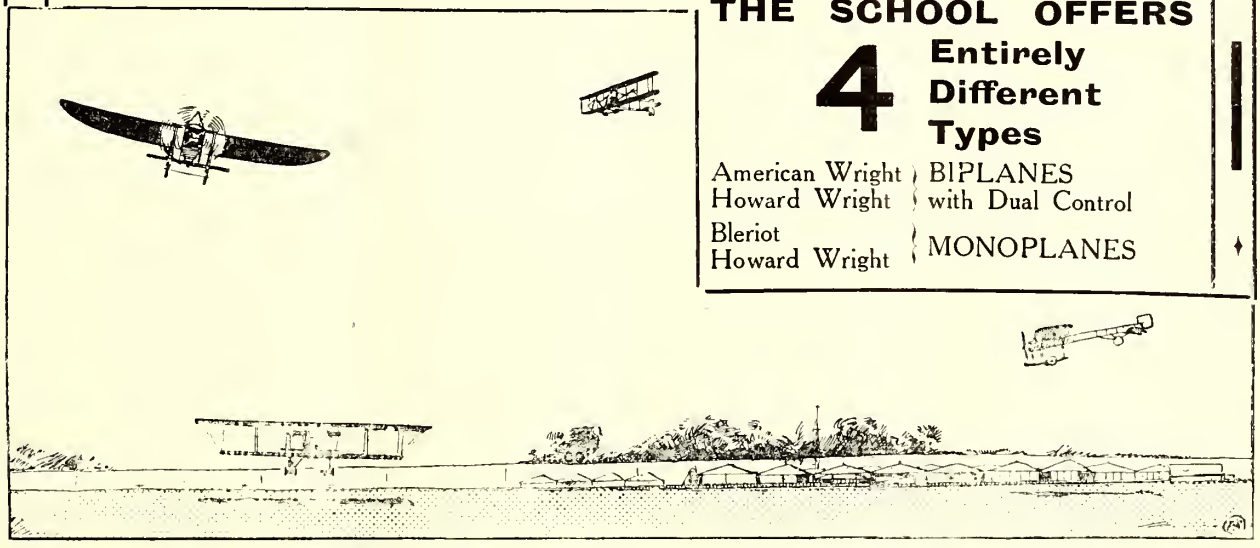

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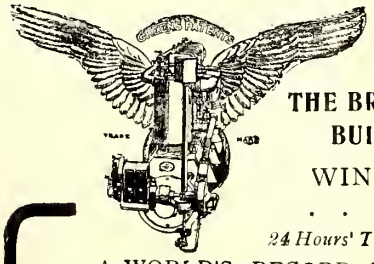

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Military Airships.

The dirigible balloon had distinctly a night out on Monday last, when Lieut. Clive Waterlow, R.E., Air Battalion, delivered his lecture on Military Airships, at the Royal United Services Institute. Sir Chas. Watson, K.C.B., one of our earliest military balloonists, who said he had built the first military balloon with Colonel Templer in 1878, took the chair.

Mr. Waterlow prefaced his lecture by saying that he thought the correct attitude was Airships *and* Aeroplanes, and not Airships *or* Aeroplanes. The dangers of dirigibles were greatly exaggerated, among those generally quoted being trouble from side winds when going into or coming out of the shed, remous, gusts, etc. Fog was unpleasant, but one could always descend to verify one's position. Danger from lightning was doubtful. Wind was not dangerous so long as one was in the air. Gusts made a machine difficult to handle, but were not dangerous except when broadside on. Abroad they had two ways of getting over the trouble of winds across the mouth of sheds. One was making the whole shed to revolve so that the mouth was always down wind. The other was to protect the opening with a wall alongside, so as to shelter the machine against side winds. The first was too expensive, the second was cumbersome but effective. The latter was tried at Farnborough with success. Then they heard of the naval airship at Barrow being anchored by the nose, so they tried the effect of a steel mast having at the top a revolving cone into which the nose of the dirigible was anchored, so that whatever the direction of the wind the balloon always rode head on. Mr. Waterlow showed some very interesting lantern pictures of this arrangement. He said they first tried it with an old gasbag, and as this stood, they tried it with the *Beta,* which was anchored there for 24 hours, during which the reports in The Aeroplane, etc., said that it was too windy for flying. No gas was put in during this period, and pressure was only kept up by pumping air into the ballonet when needed.

The *Beta,* of 33,000 cubic ft. capacity, used up about 120 cubic ft. of gas per day, and the *Gamma,* of 90,000 cubic ft., used about 466 cubic ft. per day. Records showed that in the cold dry weather in January the lift of the balloons increased. [It should be noted that the envelope of the *Gamma* was bought second-hand from France somewhere about two years ago, hence the increased leakage.—Ed.]

As to equipment, he said that a motor lorry could carry enough gas for two days' supplies, and he suggested that a dirigible equipment would consist of two motor lorries, one for the mooring mast and its belongings, and one for gas cylinders, with possibly a third for the men's kits. About 12 to 20 men were enough for the handling of the machine, and the officers could use motor bicycles. Quoting from The Aeroplane, he referred to the number of men and motor-lorries used for one single French "escadrille" of aeroplanes. [Mr. Waterlow omitted, however, to mention the extra speed and mileage of the modern aeroplane, as compared with the dirigible, and did not calculate the enormous area all the machines of one "escadrille" could cover in a given time, compared with a dirigible. Area covered per unit time is the standard of air-scout efficiency.—Ed.]

In an action between an airship and an aeroplane, the airship would act solely on the defensive. No airship should be without a weapon, for preference a gun firing time-fuse shrapnel, with a fuse-setting mechanism in the breech working from the sights. Mr. Waterlow also hinted that an airship could turn and manœuvre quicker than an aeroplane, and could defend itself in this way. He may, of course, be forgiven this error, his experience of aeroplanes being gained, no doubt, from the Aircraft Factory's efforts, and he would do well to go and see some real aviators at work, such as Mr. Grahame-White at Hendon, or Mr. Sopwith at Brooklands.

Mr. Waterlow also said that dirigibles could go up and down quicker than aeroplanes. The former statement is probably true at present, but not the latter. He also pointed out that an aeroplane could carry armament and stand still to fire. But a dirigible of less than 100,000 cubic ft. could not carry guns.

In a dirigible, if the engines broke down one was still safe, unless blown out to sea, and then one could use the ripping panel at the last moment. In the first two experiments with ripping panels on dirigibles the envelope had split from end to end. The last experiment had been quite successful.

As regards his ideal dirigible, Mr. Waterlow suggested a crew of seven, namely, a pilot observer, and another officer, an engineer, a gunner, a wireless operator, and a stand-by man. For bomb-dropping a dirigible had great advantages, but where pure speed was required the aeroplane was preferable. A scouting airship, being slower, could observe details, and send its news back by wireless. Night scouting was quite a speciality for the dirigible. For active service its speed should be not less than 45 m.p.h., it should be of the semi-rigid type, and it should have a vertical hole through the middle so that a look-out could climb up and see what was happening above.

Major Sir Alexander Bannerman, Bart., R.E. Air Battalion, said that he agreed with Lieut. Waterlow that we should think of airships *and* aeroplanes. Airships could do what aeroplanes could not do. In England we could never get enough men to handle big airships of 150,000 to 200,000 cubit feet. As regards bomb-dropping, he had seen thousands of tons of projectiles poured into a town without doing obvious damage, so he was not sanguine as to its effect.

Mr. E. T. Willows said that most people insisted in comparing the aeroplane of the future with the dirigible of yesterday. Also they forgot that experiments with airships were much more expensive per unit than those with aeroplanes. What we needed were small, handy dirigibles which one could anchor safely in winds of 50 per cent. above their own flying speed; above that wind-speed one would have to deflate. But we could have two types—small machines to carry two or three people, and big ones of about a million cubic feet. He now had in hand a small machine with an air-cooled engine and passenger and pilot enclosed in a streamline body, the envelope being of about 20,000 cubic feet. With reserve gas-tubes and all it would go on to an ordinary motor-lorry.

Capt. Broke-Smith, R.E., Air Battalion, said he believed in all these forms—dirigibles, aeroplanes, and captive machines, including balloons and kites.

Another officer, whose name was not announced, gave an interesting description of the grapnel used to anchor German dirigibles. He also described the latest Zodiac, a dirigible 600 ft. long, without ballonettes, and with a frame built of wood wrapped with fabric. This machine was 14-sided and had two engines and car. The first was to be ready in June. It had a compensating weight instead of stabilising flaps. There were 11 balloons inside of 35,000 cubit feet each.

After him there followed some entirely irrelevant and meaningless verbiage by a civilian and apparently aimless member who ought to have been suppressed in the interests of the society.

Mr. Mervyn O'Gorman, superintendent of the Balloon Factory, in a very clever speech, said he was surprised the debate had produced no opposition to airships. He took some pride in the mooring device described by Mr. Waterlow as he had sketched out the idea in 1909. He remarked on the heroism of Colonel Capper in taking the old *Alpha* (generally known as the *Nulli Secundus)* up to London. On the subject of the pull on the nose of a moored dirigible, he thought the delicacy of that organ was over-rated. The machine could actually stand a pull of some 40,000 lb., and it only had to stand 2,000. In making their mooring experiments they were afraid of the machine bobbing up and down and hitting the ground, so Mr. Waterlow hit on the idea of the dummy envelope as a test. One's childhood's experience with air-balloons on strings suggested the bobbing, though, being spherical, one would expect the air-balloons to adopt some symmetrical path. He said the limit of height for a dirigible was about 6,000 ft., because the loss of gas above that height had to be replaced on descending by pumping up the ballonette to keep the envelop rigid, and the size of the ballonette was limited. The only remedy for it in case of emergency was to puncture the ballonette and pump air into the envelope itself. Referring to the military trials, he said that pilots seemed to think the test of flying at 4,000 ft. for an hour was an undue strain, but that no balloonist felt any strain at 4,000 ft., and he seemed to think this a point in favour of the balloon. He also said there had never been an airshipwreck to a military dirigible in this country. Mr. Waterlow interposed the remark that there had been *one.* Major Sir Alexander Bannerman at once stated that the *Lebaudy* was not a military machine, but Mr. Waterlow was understood to indicate that he did not refer to the *Lebaudy.*

Mr. O'Gorman, continuing, said airships were reckoned infamous because of their cost, but a dirigible of 150,000 cubic feet cost only £6,000. [The price of about eight aeroplanes, any two of which could destroy it, excepting at night.—Ed.]

The usual vote of thanks was passed enthusiastically, and Mr. Waterlow is to be sincerely congratulated on his very able, outspoken, and honest lecture on a dangerous and highly controversial subject. One feels sure that he has not exhausted his ideas on military aeronautics, and it is to be hoped he will be asked to deliver a further dissertation on the question.

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Military Aviation and the Army Estimates.

BY W. E. de B. WHITTAKER.

The abstract of the estimates dealing with the expenditure of his Majesty's Army was published last week, and the extent of the expansion of the aerial force during the next year is revealed in them so far as is possible in the brief statement of the sums to be expended on aviation.

The total sum granted for aviation, £308,000, is not inadequate if rightly expended, but it is obvious that some change must be made in the methods of expenditure obtaining last year or the increase will be of but little use.

Last year's grant was £131,000, practically all of which was spent either on the erection of dirigibles of various degrees of inefficiency, and on the "experiments" of the Aircraft Factory which have finally, at enormous expense, materialised into two biplanes that will fly, one of which is termed "silent," presumably because it cannot be heard in the House of Commons.

In all about £30,000 of last year's vote was spent directly on aviation. Much money was muddled away in misdirected experimentation, and in the gratification of the building mania of certain officials.

The Waste on Building.

For instance, the Estimates show us that £15,000 was spent in erecting No. 2 Dirigible Shed at Farnborough. The extension of the small shed for dirigibles at Farnborough cost the country £7,300, of which £1,300 comes out of this year's Vote for Works and Buildings (Army Estimates, Vote 10), as does also £2,000 of the £4,000 expended on the erection of the Aircraft Factory Office. All this while there is insufficient accommodation for the few aeroplanes on Salisbury Plain and while the officers of the Air Battalion have to be quartered on the Royal Field Artillery at Bulford for want of separate quarters.

Before discussing in detail this year's Vote for Aviation, I give the rough details of the Vote as shown in the Secretary of State's Memorandum on the Estimates :—

	1912-13	1911-12
Establishment of army personnel for aeronautical work	£25,000	£20,000
Premium to officers gaining pilots' certificates	3,000	
Staff of new school	5,000	
Aeroplanes, stores and materials for Factory and School	161,000	85,000
Buildings, including Army share of School buildings	38,000	26,000
Land for School	90,000	
	£322,000	£131,000
Less Admiralty contribution to General expenses of School	£14,000	
	£308,000	£131,000
Increased provision	£177,000	

It would be well to deal with the largest grant first, that of £161,000 for aeroplanes, stores and materials for Factory and School. In the Estimates the sums of money dealing with aviation are arranged in a confusing way under varying heads. Little detail is given, one imagines largely owing to the lack of any definite plan at the War Office. For instance, nothing is shown to indicate even the approximate number of aeroplanes to be purchased during the coming financial year or even whether dirigibles are to take any of the money.

Salaries.

Of the £161,000 no less than £28,100 goes to pay the salaries and wages of the Factory personnel.

The most startling figure is that of the Superintendent's salary, which has been raised from £950 to £1,400. The present holder of the post is a civilian of some ability and knowledge of engineering—at least, in so far as internal combustion engines are concerned. He has, or had until recently, a large practice as a consulting engineer. His qualifications for the control of a Government factory experimenting in a science with such great possibilities do not appear to be more than those of many others who would willingly accept the position at half the salary.

If it is necessary to employ a civilian at all it would seem advisable to appoint a man with a deep knowledge of both the practice and theory of the science, and to pay him at a rate commensurate with his position in his Majesty's Service and not a salary based on a fantastic assumption of his theoretic value in civil life.

The present Superintendent is paid at a higher rate than a major-general commanding a brigade in a home command (£1,300 per annum and quarters). The Commandants at Sandhurst and Woolwich, under whose control pass all those intending to hold commissions in the Army, are paid less than the official theoretic experimenter with home-made aeroplanes.

This matter does not appear to have been arranged with that fairness which is supposed to exist in our public departments. Perhaps some member of Parliament will have found it desirable to ask searching questions in the House. Such questions have at least the merit of being awkward to those in authority.

The Superintendent's four principal assistants absorb between them £1,700 per annum. The factory employees receive in wages £25,000 during the year. I have no knowledge of the number employed, though from the sum allotted it would seem to be large, but one may be certain that these men are not over-paid. In fact, I understand that the conditions under which they work are such that the term "sweated labour" is not out of place—but money must be saved somewhere.

These payments leave £126,000, which it appears is to be devoted to the purchase of aeroplanes, engines, spares, motor cars, etc., for the army, besides all material for the factory. The expenses and prizes of the military aeroplane competition will also presumably come out of this sum. The remaining £6,000 to bring these sums to the total in the Memorandum —£161,000—disappears mysteriously in the Estimates and cannot be traced.

One can only guess the number of aeroplanes to be bought. Taking everything into consideration, it is unlikely that more than eighty can be purchased. This does not compare well with the three hundred of France and the five hundred of Germany, especially when it is remembered that both those countries possess already large fleets of aeroplanes, and that England has only five efficient machines at present. Another £100,000 would have made all the difference. Judgment must, however, be suspended until the Navy Estimates are published.

The New School.

The next sum in order of size is the £90,000 to be devoted to the purchase of land on Salisbury Plain for school purposes. If it is necessary to spend this large sum of money on land the aviation vote should have been increased by that amount, or the ground should have been bought out of grants not necessarily confined to aviation. The purchase of land is a matter affecting all arms of the Service. If the large area of land purchased is used for aviation purposes only then it will be wasted.

In the Memorandum the foundation of a joint Naval and Military School of Aviation on the land purchased is announced. The expenses are shared between the two Services.

In the Army Estimates £24,000 is allotted to buildings chiefly for the use of the school, and £5,000 is put down for the payment of the staff required. The system of a joint school is wrong. Soldiers and sailors have not in the past worked very amicably even in those matters into which controversy hardly enters. The soldier deeply resents the sailor's assumption that the naval man can do all things equally well both on land and sea. This assumption may not exist in actuality, but the bad impression is certainly there.

Who is to command the school—a soldier or a sailor? How are the expenses to be divided? If the Army has two-thirds as many smashes as the Navy, or *vice versa,* are the expenses to be equally divided or to be paid proportionately? If the latter method is adopted, how is the question of depreciation to be settled? These questions must all be answered adequately before any satisfactory arrangement can be made. Further, are all the machines purchased to be attached to the school or only a few of the simpler sort?

The Training of Pilots.

No money is allocated to training in civil aviation schools unless the £3,000 of "grants to officers who obtain air pilots' certificates" is intended to apply to future pilots and not to those who have learnt to fly in the past. Though the use of civil schools on a large scale is inadvisable for many reasons, it would seem to be good policy to extend sufficient support to such schools that in the case of war it would be possible to train many officers in a short space of time. If only a few military pilots were trained outside it would help to keep the schools in existence.

Officers should not be permitted to learn to fly at their own expense in the Government's time, for steps should be taken to

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train a sufficient number of pilots for military purposes purely at Government expense.

To return to the £24,000 to be expended on the part of the Army in the erection of sheds, etc. Simple arithmetic and a rudimentary knowledge of the building methods of the War Office make it clear that this sum will scarcely suffice for the school sheds alone, apart from the Aviation Company (Air Battalion) headquarters, which at present are non-existent.

No provision is made for the purchase of land or sheds in any of the Home Commands. And yet the formation of aviation camps in different parts of the country is an essential feature of an efficient training scheme. Imitating the gambols of circus horses over a restricted portion of Salisbury Plain is not adequate practice for war service.

If this grant of £308,000 were merely an annual vote for the purposes of military aviation, and not the total sum to be devoted to the *formation* of an air corps and the financing of abortive experiments by uninformed civilians, it would be ample.

But even to the War Office it must be obvious that the initial outlay must be greater than the annual expenditure. If the purchase of land (£90,000) and the erection of buildings (£24,000) had been supplied under a separate vote, the £308,000 would have been ample for the formation of a military air corps not inferior to those formed by the other Great Powers.

It must be realised that unless under very exceptional circumstances no supplementary grant of money may be expected during the year. To quote the Assistant Financial Secretary of the War Office in a recent lecture at the Staff College, "Everyone concerned dislikes Supplementary Estimates—the Government because they take up Parliamentary time and give opportunity for criticism . . . . and the House because it has an uneasy idea that the Estimates originally laid before it did not contain a full and frank provision for the programme of the year. And Excess Votes . . . . are distinctly in the nature of public penances for the Minister who has to present them."

French Army Aviation.

The Military Commission, under Captain Destouches, which has the duty of receiving the new military aeroplanes on delivery from the makers, took over three R.E.P. monoplanes on February 28th, at Buc.

Lieutenants Lafargue and Reimbert, accompanied by military observers, are making practice flights, on Farman biplanes, over the Sahara Desert, in the neighbourhood of the oases of Biskra, Chetma, and Oumache. Four Farman biplanes, military type, are attached to their party, and are housed in portable Bessonneau hangars at Biskra. French military aviators are proving by their flights that flying in North Africa is by no means so difficult as the results of the Heliopolis meeting would have led one to believe.

At Villacoublay, Labouret, upon a 75-h.p. military-type Astra biplane, recently made a long flight, accompanied by five French officers—Lieut. Saunier, of the Chalais-Meudon military laboratory, Commandant Estirac, Lieut. Bageot, Lieut. Glaize, and Lieut. Bresson.—W. E. de B. W.

The Latest "Military" Farman.

For some time there have been rumours of a new Farman biplane for military purposes which was said to be a great advance on anything hitherto turned out by the firm. Information from France now describes this as a small biplane with a 70-h.p. Gnôme engine, but in a general way on ordinary Farman lines.

It bears a very strong resemblance to the Grahame-White "Baby" biplane, produced early last year, in that the chassis is very small and short, and the lower plane close to the ground. The machine is open to exactly the same objections as was the Grahame-White "Baby," because, in order to give propeller clearance, the engine is now raised high up above the lower plane, so that it is slightly above the level of the seats for the passenger and pilot, with the result that in the event of a smash there is less chance of escape than even on the ordinary type of engine-behind biplane.

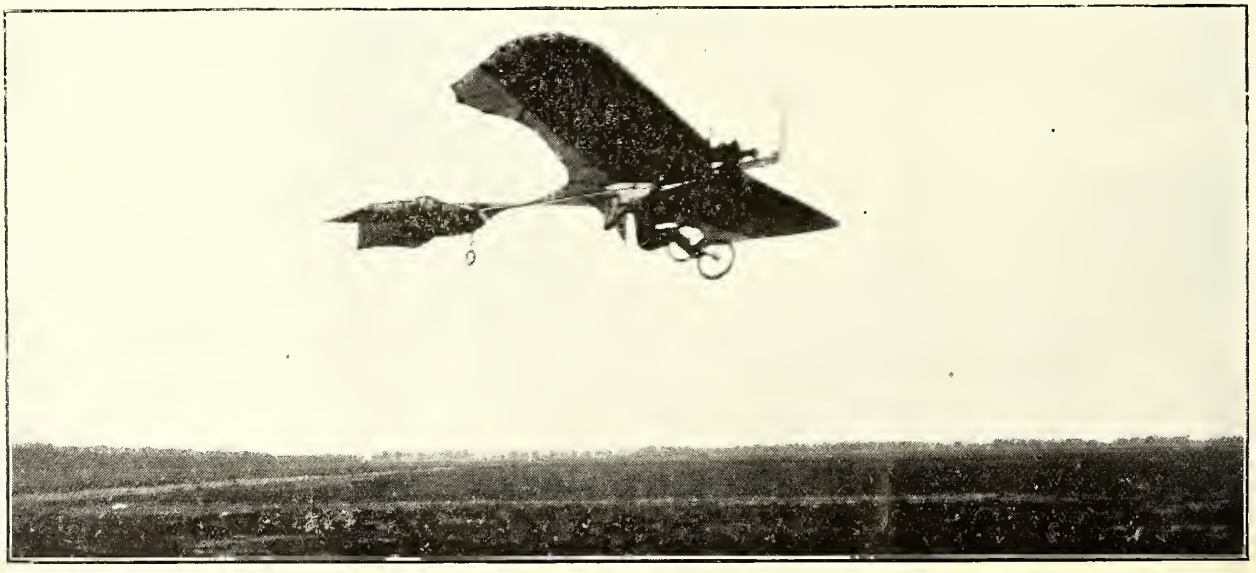
In his newest design, Mr. Farman has apparently returned to the old-fashioned front elevator. The tail is a single plane, apparently non-lifting, with an elevator flap, but the use of the front elevator seems to indicate that, as happens in some of the older machines of the box-kite type, it may be necessary to use the front elevator as a depresser so as to keep the tail up.

The machine is fitted with a more or less boat-shaped body with a comparatively narrow entry, and, of course, a "sawed-off" stern, where the engine is fitted, which is certainly not of strict streamline form, though it is possible that most of the losses incurred in this way may be made up by the fact that the propeller is working in the suction of the body.

In order to get the weight forward, the pilot is placed far out in front of the planes, and quite close to the elevator, the passenger sitting behind him on what is approximately the centre of pressure.

The spread of the machine is about 12 metres, or about 40 ft., and the weight is somewhere about 650 lbs., which is extremely light for a fast two-seater, although, of course, a machine of this particular type could not possibly be as fast as a well-designed monoplane of the same power. Judged purely aerodynamically, the machine does not appear to be any advance on our present knowledge. In fact, its principles are practically those of the first Farman machine, but with the weight taken off the tail in the manner originated by Mr. Howard Wright in the early months of 1910.

Judged purely as a means of human conveyance, this latest type appears to be open to the same objections as all engine-behind box-kites, only that these objections are somewhat accentuated by the extra speed, the lightness, and the increased height of the engine, and the decreased height of the chassis.



OUR GERMAN RIVALS.—The Grade Monoplane, a fast light single-seater, somewhat primitive in design, and very unpleasant for the pilot in a rough landing.

The Debate on Aerial Defence.

In the course of his statement in the House of Commons on the Army Estimates on March 4th, Colonel Seely, the Under-Secretary of State for War, said: "Now I come to what is called aviation—though I hope that detestable word may for ever be banished from the English language."

Mr. Joynson-Hicks: What will you substitute?

Colonel Seely: I do not know whether I care to make a suggestion on that point. The Prime Minister has appointed a Committee to consider the subject, consisting of the following: Lord Haldane (chairman), the First Lord of the Admiralty, Lord Esher, Prince Louis of Battenberg, Sir Charles Hadden, Commander Samson, R.N., Sir Robert Chalmers, Mr. O'Gorman (head of the Army air-craft), General Murray, General Henderson, and myself. They settled certain broad principles, and they devolved the working out of the complete scheme upon a technical committee composed as follows:—Generals Scott and Moncrieff, representing the Master-General of Ordnance; General Henderson, the first British General to learn to fly; Commander Samson, of the Royal Navy, whose exploits are familiar to the House as a daring sailor in the air; Lieut. Gregory, of the Royal Navy, who is also an extraordinarily expert flyer; Mr. Mervyn O'Gorman, and myself as chairman. We held many meetings; during the whole of the last recess we were at work; we made a scheme, laid it before the full committee, which accepted it in all parts, except details as to pay, and it was this morning approved by the Prime Minister, and will now be carried into effect. I will state as shortly as possible what this scheme is.

There is to be one flying corps embracing soldiers, sailors, and civilians, all who can fly, and who will undertake the obligation to serve their country in time of war in any part of the world. No man shall hold executive rank in the flying corps unless he is himself an expert flyer, and the great advantage of that only those who have helped to deal with the matter can realise. The present Aero Battalion ceases to exist, and part of it is absorbed in the new organisation. The corps will be one corps, and as far as possible all the officers will be paid alike and treated alike, because they will run the same risk and have the advantage of doing the same daring deeds. In a purely land war the whole flying corps will be available, and in a purely naval war the whole flying corps will be available for naval war. The headquarters of the flying corps will be on Salisbury Plain, for which a large tract of land has been purchased at a cost of about £90,000; it has been purchased for this special purpose, all other purposes being subsidiary.

Mr. Joynson-Hicks: How many will be accommodated?

Colonel Seely: I could not say off-hand, but I could approximately.

Mr. Sandys: Could the right hon. gentleman give a general idea?

Colonel Seely: I will tell the hon. gentleman in a moment. In the first instance accommodation will be provided for sixty officers at one time. There will be three terms of four months each, and we propose to pass through, all being well, 180 officers in each year. Therefore there will be sixty officers at one time. In addition there will be non-commissioned officers and mechanics of various kinds. If an officer wants to join the flying corps he has first to get the consent and approval of the military authorities; then he has to be passed by the doctor; then he has to obtain the Royal Aero Club certificate, and that he obtains at an aerodrome. We do not propose to use the Central Flying School for teaching officers; we propose they should learn the elements of the air elsewhere, and then come to the flying school for the more advanced course. They will have certain difficulties——

An Hon. Member: At whose expense are they to be trained before presenting themselves at the flying school?

Colonel Seely: I will come to that. After receiving the Royal Aero Club certificate and before presenting themselves, each will receive £75, which will cover the cost. This particular arrangement has been in force for some little time past, and between twenty and thirty officers have received £75 each already. They will then be attached to the Central Air School, and there they go through a course of four months. I will tell the Committee what it is proposed they should learn. They will learn progressive flying, mechanics, and construction in all its details, meteorological observations of the air, navigation and flying by compass, cross-country flights, photography from the air, signalling by all methods, and, most important, the types of warships of all nations. After this course, an officer—for he will be an officer of the Air Corps, whatever source they came from originally, whether Army, Navy, or civilians—will either join the military wing or the naval wing, or else he may go straight to the Reserve.

The military wing will consist of seven aeroplane squadrons, each containing twelve aeroplanes and a suitable number of officers to fly them, and there will be an eighth squadron, consisting of balloons and kites. The balloons will consist of two dirigibles, which now exist, two flights of kites, and the present free balloons, so long as they last and possibly longer, because we are told on all hands that the practice of observation in the air is very conveniently carried out from the safe platforms of the free balloon. A man may go to the naval wing which is to be established at Eastchurch; there will be branches of the military wing established at points not yet settled, some at Aldershot, some on the coast. The naval wing will have its headquarters at Eastchurch. The particulars are not yet finally settled, but they will be suitable. In the Reserve there will be two classes—those belonging to the first, who perform cross-country flights and will receive a retaining fee, and the Second Reserve will consist of those who have passed through this course, but who do not want to go through these flights or receive a retaining fee, but will continue in the Reserve and be available in time of war. Both the Army and Navy wings of the Air Corps will be always on a war footing, and the peace and war establishment will be the same. The Army Air Corps Factory will cease to be called the Army Air Factory, and will be the Air Corps Factory for the whole corps. Its primary function will be experiments and building experimental machinery; making big repairs of machinery where it is thought desirable; sometimes building machines, but its primary duties will be the training in expert knowledge of the numerous mechanics required for this new service. Now I shall be asked in regard to this ambitious scheme, what really is going to be the total number of men who fly and how many aeroplanes have you got? The scheme involves the purchase of 131 aeroplanes.

Mr. Lee: This year?

Colonel Seely: I am not sure whether we shall be able to buy all this year. This is not a matter of expense at all. In this the purchases of the Air Committee have been sanctioned already, and orders for a great many of these have gone out, and others are in process of negotiation. Not so many have been ordered from British manufacturers as we should wish, but that is because the technical members of my committee themselves flying men, realised, with the full approval of the whole committee, that the first essential was efficiency and safety, and it is a fact that in many respects France has gone a long way ahead of us. We could not buy British machines——necessary though it is to encourage British manufacturers, because we cannot obtain machines for use in time of war—at the price of human life, and therefore we had to reduce the number of orders we had originally hoped to give to British firms. That difficulty will soon be overcome, no doubt, because there are a great many of the best brains at work upon orders to make aeroplanes not only more speedy and efficient but safe. The risks these officers will run will be very great. The insurance rates are very high, but it is some consolation to know that in France they have enormously increased the safety of learning to fly. I know one particular school where they have covered 60,000 kilometres without accident of any kind, and there may be others that will show similar records as good, or almost as good. It is to be hoped, therefore, that the risks will be reduced, but they will still be very great, and for that reason I trust the House of Commons will not grudge the expense involved in making adequate payment to those officers and giving an adequate scale of pension in the event of their being rendered unable to continue their service.

I may take it I may rely upon the House for every assistance in this matter, if for no other reason than that of the dangers in this business. One hundred and thirty-three officers are required for the military wing, and for the naval thirty or forty; and for the Reserve the number we shall work up will depend on how the science progresses in the near future. We have the 133 military officers, but we have no doubt many will volunteer who will not only learn to fly, but will fly without accident. That brings me to the point as to why we suggested what is not settled, that these officers should learn to fly at private flying schools. There are two reasons. First of all, because it is so desirable we should encourage private effort

as far as may be; and, secondly, we believe there is less risk of accident in the initial stages if we proceed by these methods. It is largely the feeling in France that it is greatly to the interest of the aeroplane to avoid accidents altogether. After learning the elementary art of flying officers will come to the Central Flying School, where they will not run the same risk, because they will have learned the elements already.

Mr. Lee: May I ask the right hon. gentleman whether any officer who chooses to qualify for learning to fly at a private school will get £75, or will it be only such as are invited to learn through the Government?

Colonel Seely: The answer is that for the moment any officer who is approved by his commanding officer and the proper military authorities, and is passed as fit and obtained his certificate, will obtain £75, because we are very short of members, but when we get up to our full number the phrase, "Let 'em all come!" which now applies, will no longer apply.

Mr. Malcolm: Will the officers learning be available for compassionate allowance or pension?

Colonel Seely: That is not laid down in the scheme, but I think it certainly should be the case. I am glad the hon. member has brought it to my notice, because if these things are not laid down at the start they may bring hardship. I will see that that should be laid down. Now in regard to the encouragement of private enterprise, we propose to do it not only by getting officers to obtain their certificates privately, but also by the purchase of aeroplanes in this country as far as possible, and by renting sheds and landing rights in different aerodromes. We think it very desirable that there should be more aerodromes in this country in order to encourage cross-country flying, and the establishment of more landing places is bound to be essential if we are to keep in the first rank. Scientific research will be continued in co-operation with the Advisory Committee set up by the Prime Minister a short time ago. This is a very ambitious scheme, and it is an entirely new scheme for a new service. We have worked very hard to make a good scheme, and nobody is more conscious than I am, as Chairman of the Committee, that we must have made a great many mistakes and there must be a great many omissions from the very nature of the case, owing to the novelty of the science we have had to study. I think and believe that even with all those mistakes and omissions we have laid the foundation of a plan which will ensure that this country in the long run, and sooner rather than later, shall be able to hold her place in the air as she has done in the centuries past both on land and sea.

Mr. Sandys: I should like to make one or two remarks with reference to that portion of the right hon. gentleman's speech which he devoted to the subject of military aviation. I am obliged to use that term, although I know it is objectionable to the right hon. gentleman, but I cannot think of any better one to describe it. I was very glad to know that under the present Estimates we are going to have much more generous provision for this important branch of military science than last year. The Government have now at least abandoned what I may call the Micawber-like attitude of waiting for something to turn up, and have decided to do something for themselves. I think the right hon. gentleman is not devoting too much time to this question of military aviation. Our Army is a small one, and, because our Army is so small, it is all the more necessary that these technical branches should be the more highly developed. Especially so is this the case when we remember that, in time of war, our small Army has to be enlarged by improvised troops. In case of serious war I am inclined to think this is a very undesirable policy, but, as it is admittedly the policy of the Government at the present time, I suppose we shall have to do the best we can, and under these circumstances it is quite evident, so far as the technical branches of our Army are concerned, we must make provision, not merely for our Regular Army as it exists, but for that additional Army coming from somewhere or other if we are involved in serious military operations. I am glad the right hon. gentleman and the Government have appreciated the importance of this development of the science of military aviation. A great deal of attention was attracted to the French manœuvres last year. I will not deal with that point now, except to say it was evident, as a result of those manœuvres, that an army which went into the field unprovided or inadequately provided with efficiently trained officers and the best class of machines for the purpose of gathering information, was courting risk and almost certain disaster. As one result of those manœuvres, the French Government, which voted £750,000 for aviation last year, on February 13th last decided to allocate another £1,000,000 for similar purposes this year. I only mention those figures because of the comparison I wish to draw later on with the sum asked for by the right hon. gentleman. So far as the scheme of organisation which the right hon. gentleman outlined in his speech this evening is concerned, I will only say it seems to me an admirably thought-out scheme, and one which certainly is going to get an aviation service for our Army and Navy far and away beyond what we had reason to anticipate a year or two ago. There are one or two points the right hon. gentleman did not make clear. I would like to know whether this new flying corps is to be an entirely separate organisation, or will it be to a certain extent under the Royal Engineers?

Colonel Seely: No.

Mr. Sandys: I am very glad to hear that. I think it will give us a much better organisation than could have been secured under the management of the Royal Engineers. I understand that in this new organisation soldiers, sailors, and civilians are to take part, and it is very satisfactory to have the statement by the right hon. gentleman that all those officers who hold executive positions are to be themselves qualified flying men. I also understand that after to-day the Air Battalion ceases to exist. That is not a very great loss, because although the right hon. gentleman was unwilling to give me the particulars for which I asked the other day, the Air Battalion, I believe, only consisted of five officers, twenty-five non-commissioned officers and men, and five modern machines suitable for Army purposes. I think, although I agree with him in the high opinion expressed of these five officers and these men who have been able to play such an important part in the development of our Army aviation, it was not a very big contribution towards the somewhat ambitious scheme which he has outlined. As I understand, the right hon. gentleman was not yet in a position—I hope he will soon be—to settle the question of the pay of aviation officers. I am glad that the Government have adopted the scheme which has been carried on for some time in France—at least, I understand that that is the opinion of the Government, that officers irrespective of rank should be paid a fixed additional sum in recognition of the dangerous service which they are undertaking in joining the aviation branch. I am sorry the question of pay is not yet definitely settled. I hope when it is settled it will be upon an adequate basis with full recognition of the hazardous service which these officers are engaged in.

As I understand from the right hon. gentleman, during the course of the year sixty officers, during three terms of four months each, will pass through the school—that is, 180 officers in the course of each year—and after this course they will go to the military or the naval wing, or else to the Reserve; but he did not make it quite clear whether the military or naval officers are to go to the Reserve or whether the Reserve is entirely for the civilian portion. Perhaps he will make that clear in the course of the Debate. I should like to make one more remark with reference to the military wing, which he told us was to consist of seven air squadrons, each of twelve machines, 84 machines in all. He also referred to an eighth squadron of balloons, kites, and dirigibles, and referred in particular to two dirigibles which he considered were available at the present moment. I should like to have some further particulars as to our position with regard to dirigibles. I think the whole situation wants clearing up. We want information with respect to the Clement-Bayard and the Lebaudy, and also with reference to the *Beta* and *Gamma*, which are only, I think, for the purposes of instruction, and not for actual military work, and we have also been a good deal exercised with regard to the *Delta*, upon which, I understand, a considerable amount of money has been expended. Will the right hon. gentleman, in the course of his reply, give us some information with regard to dirigibles? I am sure it will be of great value. With reference to the naval wing, he told us it was to be situated at Eastchurch, where some naval aviation has already taken place, and I should like him to give some indication as to where the military wing is likely to be stationed, and as I gather that the sum of £15,000 is allocated in this estimate for the purpose of constructing a dirigible shed, I conclude that dirigible shed will be constructed upon the place where the military wing is actually to be situated, and I hope that there will be some definite plan in regard to it. There are two other points. The air-craft factory expenditure has gone up from £85,000 to £161,000. The right hon. gentleman indicated that this factory was to be for experiment and construction of experimental machines, and sometimes for building. I hope he will stick to that word "sometimes." There was built in that factory a new aeroplane about which there was some discussion some months ago and which has turned out a complete success; but I hope he will not adopt the policy of having machines

built only in this factory, but that he will follow the sounder policy which has been adopted in France of giving some encouragement to manufacturers who are building these machines, so that we may have a large number of independent factories available for the production of these aeroplanes at a time of national crisis and danger.

Another point I would like to have cleared up was referred to by the right hon. gentleman when he said we should want 131 aeroplanes and 167 officers; I am including the 34 naval officers to whom he referred. Looking at that from the financial standpoint, I find that last year we had a sum of £131,000 allocated to aviation. That gave us in the most flourishing period of the Air Battalion six efficient machines, and six officers engaged in aviation in that Battalion. For these six machines and six officers an expenditure of £131,000 was required, and for 131 aeroplanes and 167 officers it is suggested that a sum of £320,000 will be sufficient. I think the finance of that requires a little examination, especially as the right hon. gentleman indicates that considerable sums are going to be allocated for rent of sheds and landing places, which are very desirable, I agree, in different parts of the country; and also that out of that £320,000 no less than £90,000 is going to be spent upon the purchase of this property, the extent of which the right hon. gentleman is not yet in a position to tell us. If this £90,000 is to be expended on land, and £38,000 on buildings, we have really to deduct from that £320,000 a sum of no less than £128,000 for what are really capital charges, and then the right hon. gentleman suggests we shall still be able to get 131 aeroplanes and 167 officers. One other point is with regard to the mechanics. The right hon. gentleman did say something about the mechanics and the necessity of getting a larger number of highly trained mechanics for this particular Service. I hope he will do so, and I do not think he will have so much difficulty as some people expect may be the case, because you can get a reasonable number of skilled men for this work. At the present time I believe there are only 21 men available as mechanics who are all members of the Royal Engineers. It is not quite evident how many more will be required, and it may be difficult to get them in a hurry. I hope that suitable men will be able to apply direct, not only from the Royal Engineers, but from any other regiment. I would suggest that suitable mechanics who are at present in other regiments should be given an opportunity of transferring into the Air Corps. In fact, volunteers might be got from all round. But it is absolutely essential that these men should receive an adequate rate of pay. At present some of the men who are doing this arduous work, which entails getting up at all hours of the morning, and is of a very responsible character, because the lives of these aviators depend on the efficiency with which these mechanics do their work, are only being paid at the same rate as men who are engaged in digging trenches. That is an unsatisfactory state of affairs, and I hope the right hon. gentleman in his new scheme will provide for proper pay for these men who occupy a very responsible position indeed and upon whose integrity the safety of men's lives depend. I am glad to hear that it is going to be the policy of the Government to encourage cross-country flights far more than has been the case in the past. I understand the right hon. gentleman is going to expend a considerable sum of money immediately on the purchase of further aeroplanes. I hope he will do this in time, so that we may have a proper aviation service, or at any rate a certain aviation service, ready for the manœuvres next summer, because it is highly desirable that our officers should become accustomed as soon as possible to the new conditions which prevail.

With reference to the purchase of this ground, for which the very large sum of £90,000 is being allocated, that is to say between a third and a fourth of the whole sum which is put down for aviation, the property is either land of a very valuable character indeed or else is of very considerable extent. I am told it is about 12,000 acres. That seems to me a very large property indeed for the purpose for which it is supposed to be required. I believe it is situated in the neighbourhood of Upper Avan village, and I have been told it is really not altogether an ideal place for this particular purpose on account of the unevenness of the ground, which consists largely of spurs and ridges, and is really in some respect most undesirable for this purpose. But I do not think such a very large property is desired. I am told that about 1,500 acres is all that is wanted for aviation purposes, and, at any rate, I shall be glad of an assurance that this property is entirely for aviation purposes and is not going to be used as a camping ground, for instance. The right hon. gentleman has outlined to us what, I think, is a very satisfactory, but, we must admit, a very ambitious scheme in view of the actual sum which he has allocated to himself for carrying it into effect. We must congratulate him on having recognised the importance of the development of military science and on having recognised the fact that we are behindhand, and that we have to make up for lost time. When I consider his scheme, without having seen it actually in print, I am inclined to think that additional money will be required in order to carry it into effect, but if it is required I am certain the right hon. gentleman will have every support from members on this side of the House, because I know we are determined, as I think the right hon. gentleman himself is determined, that we shall have an aviation service which shall be adequate for the needs of our Army and for the safety of the nation generally.

Marquess of Tullibardine: I should like to congratulate the Under-Secretary on the success of his endeavours so far as aviation is concerned.

The Supply of Officer-Pilots.

[Translated by Captain J. D. B. Fulton, R.F.A., Air Battalion, Army Interpreter, from "The Excelsior."]

"I will at all costs keep France in the front rank of aerial navigation," said M. Millerand, Minister of War, to the officer-pilots whom he has taken care to receive personally once every fortnight in order to consult direct with them, without any intermediaries, and obtain their opinions and advice.

The following are some of the conclusions which have been arrived at:—

It is desirable [where have I heard that word before?—Ed. Aeroplane] that officers who wish to become Army aviators should be summoned annually to the aviation headquarters of their military district, where they would be submitted to the following tests:—

(1) An examination as to medical fitness. Age from 25 to 40. A preference to be given to those who habitually lead an active life, and especially to those who have familiarised themselves by use with motor-bicycles or motor-cars.

(2) The candidates will each be taken for a flight of over 3,000 ft. in puffy weather, or if the air is calm the machine will be intentionally rocked about by the pilot.

(3) The prospective pilots will be examined as to their technical and practical knowledge, especially on the subject of aerial engines.

These preliminary steps will eliminate a proportion of the candidates. The remainder will be then put to work, and those who show no signs of possessing useful qualities at the end of six months will be returned to their regiments.

The pilots will receive technical and practical instruction at the central establishment at Vincennes, embracing engines, construction and adjustment of machines, meteorology, strength of materials, and map-reading.

As soon as a pilot obtains his military brevet he will be seconded to a corps at one of the military aerodromes; and the pilots will take their turn at the different manœuvres held from time to time, in observing artillery fire, reporting movements of cavalry, etc. Finally, they will take part in the grand manœuvres.

Every effort will be made to ensure that the flights normally made by pilots shall as far as possible be carried out under conditions resembling those obtaining on active service.

In the opinion of many aviators three years appears to be a reasonable limit at which to fix the period passed at aviation work, taking into account the physical strain inseparable from the profession. At the expiration of this active period pilots will either return to their own branches of the Army or will be given other duties connected with aviation.

All officers *actively engaged* in flying will receive extra pay at the rate of 10 francs per day. All pilots who take part in manœuvres or who perform certain tests which will be laid down will reckon each year passed in aviation work as war service.

All serious injuries will be counted as if on active service.

Decorations and medals will be distributed annually after manœuvres, on the actual ground.

More Automatic Devices.

It is reported from Wolverhampton that Mr. F. W. Baker, the well-known motor agent of Stourbridge, and Mr. J. S. Foley, of West Bromwich, are about to experiment with an automatic stability device at Tunstall Park, where the Midland Aero Club once endeavoured to start an aerodrome. Let us hope that their efforts will be on more reasonable lines than are most "automatic" devices, the majority of which are about equivalent to fitting a pendulum inside a ship to prevent it from rolling, or fitting a wagging tail instead of a propeller.

The Week's Work.

The Worst Week on Record—Fire at Brighton-Shoreham—Shoreham to Eastbourne—Mr. Sopwith with Passengers in Half a Gale—The First Short Monoplane doing well—Another Territorial Certificate—Mr. Grahame-White Challenges for the Gordon-Bennett—Progress of Invalids.

Monday, February 26th.

Brooklands.—At Bristol School Lieut. Longcroft took certificate in splendid style, name duly inscribed on wing of old school biplane, now bearing names: "Harrison, Harford, Allen, Benwell, Gordon, Garne, Merriam, Weeding, Carfrae, Smith, Longcroft." All certificates taken on same machine without serious breakage. Later Mr. Fleming up with Major Sir Alexander Bannerman, Bart., R.E., Commandant of Air Battalion, giving him instruction. Captain Raleigh also out. At Flanders School, Mr. Kemp doing circuits in good style, and Mr. Jacques rolling.

Brighton-Shoreham.—Lieut. Lawrence left on Blackburn 8.45 a.m., and following coast line, passed Brighton, Newhaven, Seaford, and landed on beach at Eastbourne at 9.20. That this cross-country flight should be accomplished after only about seven flights on monoplane speaks well for both aviator and machine. Landing on beach with wind behind very clever. Gnôme stopped so had to do as best he could. Wheels buried in shingle, but absolutely no damage done.

Hendon.—At Blériot School M. Pothet managed to put in two straight lines before wind rose. Remainder of week bad weather made all attempts at outside work impossible.

Tuesday, February 27th.

The Plain.—Jullerot tested conditions and gave tuition flights, but no sustained flying.

Wednesday, February 28th.

No flying. Wind and rain.

Thursday, February 29th.

Brighton-Shoreham.—Serious fire in small hours of morning. One or two people leaving Shoreham Town Hall after Leap Year Ball noticed flames in direction of aerodrome, and immediately set off across Norfolk Bridge and discovered that three hangars were ablaze. Several policemen arrived on scene and rendered valuable aid to party already engaged in fighting the flames. Shortly after, Shoreham Fire Brigade turned up, and it was apparent that fourth hangar would catch fire, so part of this one was cut down, thus saving rest of block. Loss is chiefly to Messrs. Chanter and Co., two Blériots and one Nieuport type, as well as two engines, being destroyed. Lieut. Lawrence luckily away at Eastbourne, otherwise Blackburn monoplane would have been destroyed also, as his hangar was gutted. Collyer-England's biplane and the Metzgar-Leno monoplane both taken out of sheds for safety, and damage is estimated at £1,000 or more. Cause of fire unknown, everything being all right when the occupiers left. It is understood that Messrs. Chanter and Co. are partially insured, which is some consolation.—[C. A. C. Winchester.]

The Plain.—Several trials made during morning, but decided not attempt school work.

Friday, March 1st.

No flying. Wind and rain.

Saturday, March 2nd.

Hendon.—At W. H. Ewen School, owing to weather during past week, pupils have not been able to get in any practice. Time profitably spent, however, assisting in constructional work which is going on. Quite an amount of interest created by arrival of new 5-cylinder Viale from M. Ducrocq of Brooklands.

Sunday, March 3rd.

Brooklands.—In afternoon Mr. Sopwith out in very bad wind, and later in evening up on Wright with Mrs. Lane, and with Mr. Smythe, in spite of gusts. M. Ducrocq for a couple of circuits on biplane. Mr. Pizey testing Bristol monoplane and new school biplane.

Hendon.—At Grahame-White School climatic conditions unfavourable for flying all week until to-day, when during brief spell of fine weather Mr. Lewis Turner took out biplane No. 2 and made several circuits, but had to discontinue owing to wind.

The Plain.—Jullerot up making flights with pupils, but no solo work allowed on account of wind.

Eastchurch Notes.

Owing to bad weather throughout the past week very little flying was possible at Eastchurch. Commander Samson, R.N., was out for a short time on the new "Short" monoplane, which flew very steadily in wind which showed twenty miles per hour on the ground. Captain Gerrard, R.M.L.I., was also out on the triple twin biplane.

No further flying was done until Monday morning last, when the Territorials were out early, taking advantage of a calm atmosphere which lasted from 6 a.m. to 8 a.m. Sapper Meredith taking advantage of this opportunity to go for his pilot's certificate, for which he qualified in an excellent manner, thus making the third Territorial to gain certificate in the last seven days.

Commander Samson, R.N., and Captain Gerrard, R.M.L.I., were also out, the former on the "Short" monoplane and the latter on the Naval School Machine No. 34.

The debris of the Chanter sheds at the Brighton-Shoreham Aerodrome; the wreck of the Chanter-Nieuport in the foreground.

Photograph by F. Rowe, Shoreham.

The Liverpool Aviation School.

Mr. Henry G. Melly, principal of the Liverpool Aviation School, writes that the weather still continues too boisterous for any progress to be made by pupils. On Saturday last Mr. Melly had out the two-seater and gave the Gnôme a thorough testing with his pupil, Mr. Hardman, at the controls. Everything was found to be in first-class tune, and the machine will be tried on the earliest opportunity. In the meanwhile, the workshop is busy making school propellers of the same model as the first made, which has proved so successful. These propellers will be a great saving to pupils, as they can be turned out at about half the cost of the usual five-ply propellers. Other work this week includes the fitting of a "Melly release gear" on the Anzani-Blériot, which should be a great help in getting off the ground quickly.

The Royal Aero Club.

The annual general meeting of the members of the Royal Aero Club of the United Kingdom will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

The following members have so far been nominated for the Committee:—*Ernest C. Bucknall, *Col. J. E. Capper, C.B., R.E., *G. B. Cockburn, Harry DelaCombe, Capt. J. D. B. Fulton, R.F.A, Major F. Lindsay Lloyd, *E. Manville, Fred May, *J. T. C. Moore-Brabazon, Norman Clark Neill, *Sir Charles D. Rose, Bart., M. P., *A. Mortimer Singer, *Hon. A. Stanley, M.P., *R. W. Wallace, K.C.

*The names marked with an asterisk are those of members of the present Committee.

On the 27th ult. the following new members were elected:—Lieut. D. G. Conner, R.F.A., and Comte James de Fitz-James.

The following Aviators' Certificates were granted:—(186) Marcel Desoutter (Blériot monoplane, Hendon); (187) Lieut. Stephen Christopher Winfield-Smith (Bristol biplane, Brooklands); (188) Lieut. Cecil Thomas Carfrae, R.F.A. (Bristol biplane, Brooklands). The request of the Aero Club of America to grant an Aviator's Certificate to Mr. William Hoff was sanctioned.

Mr. Henry Salmet, who, on February 25th, made a flight over Hampstead and descended in Regent's Park, attended before the Committee. Mr. Salmet explained that, in his flight towards Croydon, he had no intention whatever of flying over London, which he had proposed to leave on his left hand. He further explained that he lost sight of the ground owing to the fog, and, eventually finding himself over houses, he made a descent at the first open space to ascertain his whereabouts, which turned out to be Regent's Park. The Committee, after consideration, accepted this explanation, and considered that the circumstances of the case excused his actions.

The Wright Company, through the Aero Club of America, have given the following guarantee regarding aeroplanes taking part in the Gordon-Bennett race:—

"In the interest of good sport, the Wright Company will permit representatives of foreign nations to participate in the 1912 race for the Gordon-Bennett Cup, regardless of any questions as to whether their aeroplanes do or do not infringe patents owned by this company.

"The Wright Company will not bring suit against representatives of foreign clubs because of their participation in this contest for the Gordon-Bennett Cup.—The Wright Company, Wilbur Wright, President."

The Royal Aero Club last week cabled to the Aero Club of America asking for an undertaking from the Wright Company to take no action whatever against British aviators or in respect of their aeroplanes for a period of three months from date of arrival should they enter for the Gordon-Bennett Aviation Race. A reply has been received to the effect that the Wright Company will guarantee nothing beyond the assurance already given.

The Invalids.

Most of our invalid aviators are doing quite well, thanks to the healthy life an aviator leads. Mr. Herbert Thomas, who was hit on the head by a loose propeller at the Bristol Works, is progressing, in hospital, at Bristol, as well as can be expected, as is Captain de Winckels at Amesbury, who had so bad an accident with the Bristol monoplane on Salisbury Plain. Neither of them were expected to last out the night after their accidents happened. Captain Watkins, in hospital at Weybridge, now proves to have some broken ribs as well as a broken thigh, but he is making excellent progress. Lieut. Seddon, R.N., at a private home in London, has had bad luck, for, though his leg is mending well, he recently developed appendicitis, and had to have his appendix removed. Mr. Dunne has quite recovered from his serious illness at East Minster, in the Isle of Sheppey, and is now going away to recuperate.

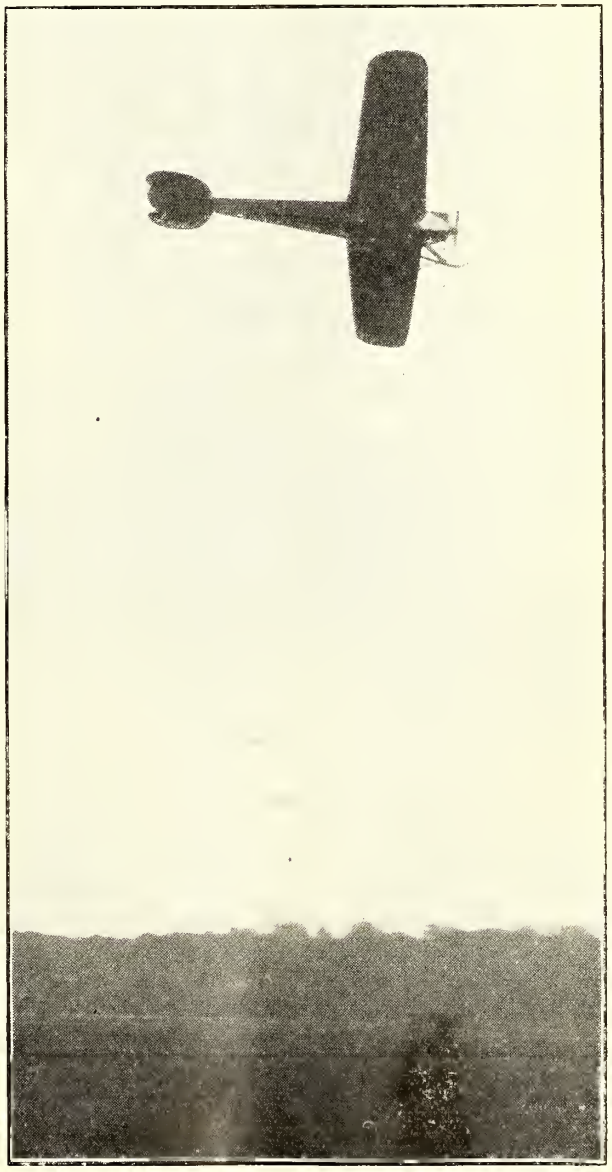
The Gordon-Bennett Aviation Cup.

It is announced by the Royal Aero Club that they have forwarded a challenge to the Aero Club of America for the Gordon Bennett Aviation Cup. England will be represented by Mr. Claude Grahame-White only.

It is a matter of common knowledge that the winning of the Gordon Bennett does not carry with it any financial profit, as the expenses entailed are so high. All honour to Mr. Grahame-White that he should undertake, purely for the sake of sport, the representation of England.

There is no one in Great Britain more competent to uphold the name of English avitaion, and everyone will sincerely wish him the best of luck.

Mr. Grahame-White has done more than anyone to uphold this country's reputation abroad, and he might well be excused if he decided to give up competition flying, now that he has a large and, let us hope, increasing business responsibility on his shoulders. It is therefore all the more to his credit that he should step into the breach when it looked as if this country was about to stand down.



Mr. Ronald Kemp doing a banked turn on the renovated Elanders at Brooklands last week.

The Flanders Monoplane.

One of the most remarkable machines of to-day is the Flanders monoplane, which has been flying so well of late at Brooklands.

Scale drawings and a technical description of the machine appeared in The Aeroplane some months ago, but the accompanying detailed drawings by Mr. Millar will give information about the machine which cannot possibly be conveyed in any other way.

It will be recollected that Mr. Howard Flanders, after spending a large amount of money on purely scientific experiments, made up his mind last summer that he would build what he called an ordinary machine more or less like anybody else's, and make it fly. The machine was designed in about a week, built in not very much over a month, and flew excellently at its first appearance. For a considerable period it performed exceedingly well, and then was, unfortunately, smashed up.

In the process of reconstruction a number of differences were made, among other things a new Green engine being fitted, and the position of the radiators entirely altered. Also wings of a different curve were fitted, so that to all intents and purposes it is a new machine.

In the process of alteration and in the fitting of wings of different section the balance of the machine was entirely altered, so that on its completion quite a variety of experiments had to be tried to get her back to the flying form approved by Mr. Flanders and his clever pilot, Mr. Ronald Kemp. However, the demonstrations given by the machine during the past fortnight show that she is now in excellent form.

In the illustration showing the general view of the front of the machine Mr. Millar has drawn the machine with one side of the housing of the fuselage removed, so that the method of fixing the engine can be seen. It will be noticed that the engine is carried on very stout wooden girders, which are themselves connected direct with the main struts of the chassis, and that the outer members of the fuselage really do very little except carry the casing till they merge into the part by the pilot's seat, where they become the main members of the frame itself.

The outstanding point about the machine is the extreme care with which everything has been made in streamline form, even the main exhaust outlet, the little "header" on the subsidiary radiator, and the upper and lower cabane have been carefully streamlined. In order to reduce any possible head resistance in the warping gear a streamline pot has been placed over it, as may be seen in the small sketch.

As a matter of fact, the experiments have shown that this streamlining has had quite a remarkable effect on the balance of the machine, as prior to this there was sufficient drag underneath to give the machine a distinct tendency to pull down by the nose.

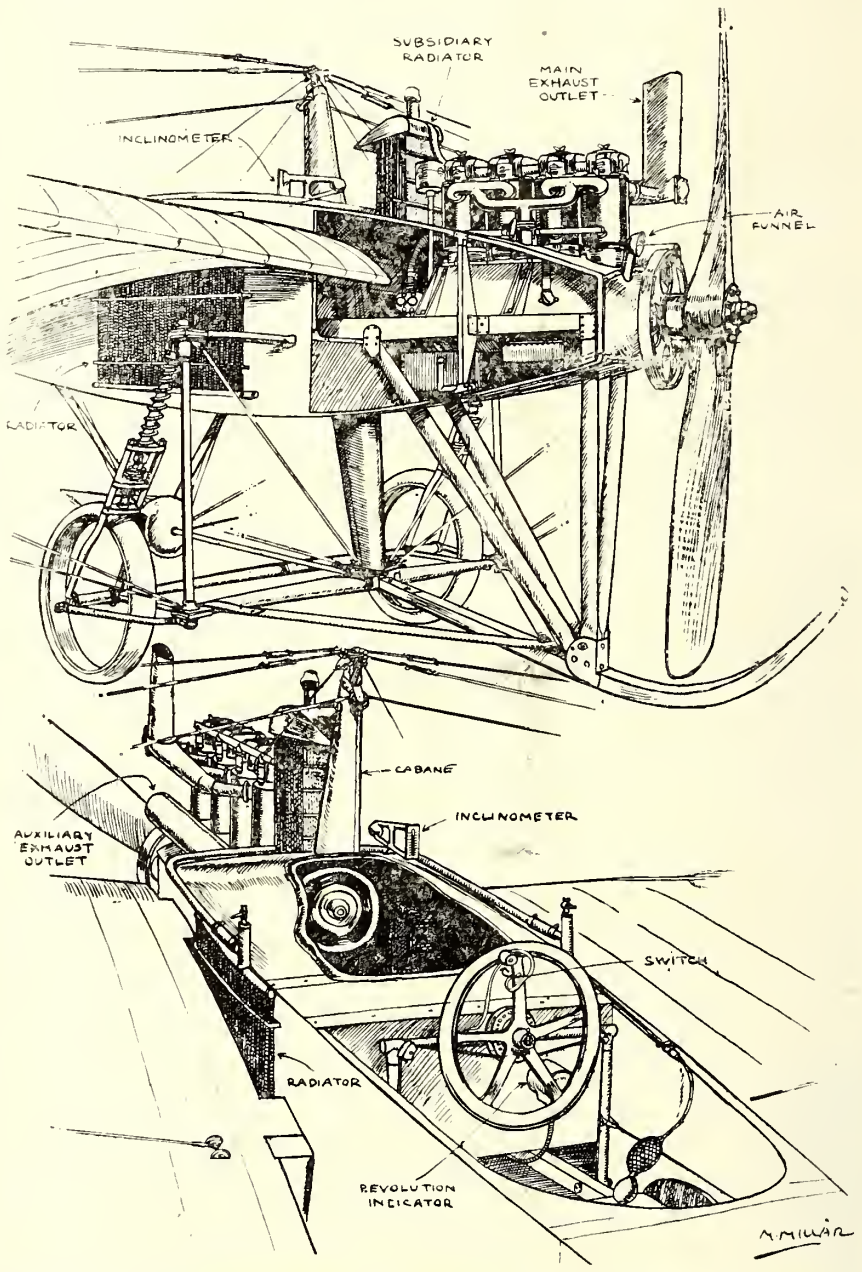
In the sketch which shows the control arrangements it will be noticed that the passenger seat, which is in front of the pilot, also has a streamline covering which comes right up to the passenger's shoulders.

The Flanders machine is so beautifully proportioned that when in the air it looks comparatively small, whereas, as a matter of fact, it is a very big machine indeed, and owing to the solid construction is far from being a light one. It is, therefore, a distinct testimony to the power of the 60-80 h.p. Green engine which is used in it that the machine flies so well. It should be said that since this particular engine has been properly tuned up it has given no trouble at all.

In the sketch of the passenger accommodation it will be noted that the control wheel is fitted on a cross bar, so that in the event of a bad landing the pilot is not liable to be damaged by a central control post. The bulb arrangement shown on the right-hand of the pilot's seat is an ordinary scent-bottle bulb, which is used to keep up the pressure in the petrol tank.

In front of the passenger is an inclinometer, which shows more or less accurately the angle at which the machine is travelling, this indicating whether she is flying up to her proper form or not.

On the left-hand side of the engine will be noticed not only the ordinary exhaust pipe, but another large pipe below. This

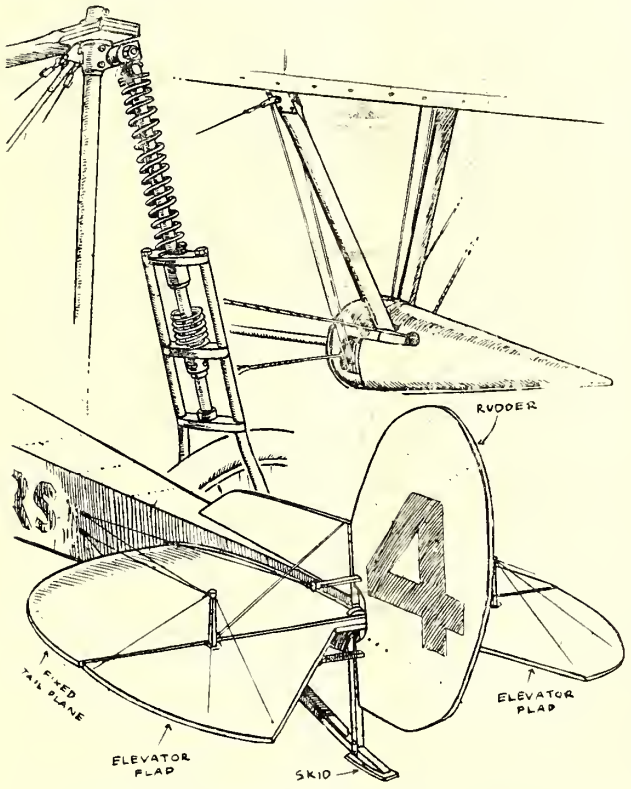


The front of the fuselage and the seating of the Flanders Monoplane.

is a collector for the exhausts from the auxiliary ports. The end is open towards the front, so that there is a continual draught down the pipe, carrying the exhaust gases out under the body of the machine.

The whole front is cased in metal, so that there is practically no chance of anything else burning if the carburetter should catch fire.

It will be noticed that the chassis is a kind of combination of the Blériot type with the Antoinette. This has been found most satisfactory in practice, for the heavy springing gives plenty of play to the wheels, and takes bad shocks in landing, while the trussing in front has on many occasions saved the machine from standing on its head on rough ground.



The wheel springs, the streamline cover to warping gear, and the tail arrangement of the Flanders monoplane.

Since the reconstruction of the machine a small vertical fin has been added in front of the rudder. A fixed tail of considerable area is still used, and although the elevator flaps are comparatively small, they are quite big enough for their work, the machine answering very quickly both vertically and horizontally. It should be noted that this particular machine is the first one that Mr. Flanders has built, and though it is fully equal to any other machine in this or any other country, so far as speed for power and weight lifted is concerned, it does not by any means represent Mr. Flanders' ideal of what an aeroplane should be, and one may look forward confidently to something particularly excellent when his machines for the military competitions materialise.

CONTINENTAL NOTES.

Information received from Pau states that Lieut. Ducourneau, whose death was reported last week, was killed while flying a Nieuport. The accident is one of those apparently utterly unexplainable affairs, for all that is known is that his propeller burst in the air, and the machine came down in a heap. At first sight it does not seem in the least possible that a propeller bursting on a monoplane could do any damage to the machine, and there have been many cases in which, where the propeller has broken, the pilot has simply switched off, and glided down in safety. The only accident one can call to mind which bears any resemblance to this is an accident which occurred to M. Blériot over a year ago, when a propeller broke in the air, and a piece of it, by some mysterious means, flew back and cut a large hole in one wing, about half-way between butt and tip and half-way between leading and trailing edge. All theory would point to a burst propeller blade flying forward, owing to the fact that it is pulling the machine behind it, and, therefore, any pressure which is not centrifugal must be in a forward direction, and one can only assume that, in bursting, a slice of the propeller must have split in such a shape that it had a backward throw. It is therefore possible that a piece of the propeller, flying back, may have struck a wing stay and broken it. At any rate, it is certain that the accident happened through a bursting propeller, and it is therefore another strong argument in favour of gearing down and running the propeller slowly, for this not only gives a more efficient propeller, but it decreases the speed, and with it the centrifugal force, so that there is much less chance of the propeller bursting.

On Saturday several of the London newspapers stated, with their usual degree of accuracy, that Védrines, flying at Pau on March 1st, had attained a speed of 187 miles an hour. In truth, he had again succumbed to his habit of breaking records, but his highest speed was actually about 180 kilometres an hour. He flew on a 140-h.p. Deperdussin monoplane for an hour, covering in that time a distance of 164 kilometres 431 metres. His times are as follows:—

	New Records. Védrines. February 29.	Old Records. Védrines. February 22.
	h. m. s.	h. m. s.
10 kilom. ...	0 3 35 4-5	... 0 3 43 1-5
20 ,, ...	0 7 14	... 0 7 27
30 ,, ...	0 10 53 1-5	... 0 11 10 2-5
40 ,, ...	0 14 32 1-5	... 0 14 54 2-5
50 ,, ...	0 18 10 2-5	... 0 18 38 2-5
100 ,, ...	0 36 23 1-5	... 0 37 22 2-5
150 ,, ...	0 54 35 3-5	... 0 56 17
170 ,, ...	1 1 55	
		k. m.
¼-hour		... 40 374
½ ,, ...		... 80 374
1 ,, ...		... 164 431

The next day he again broke the 10-kilometre record by flying a circuit of that length in 3 min. 34 2-5 secs. at an average speed of 167 kil. 910 m. an hour (almost exactly 100 m.p.h.).

Tabuteau, who generally breaks records the day after Védrines' various attacks, succeeded in carrying off two records, the 200 kil. and the 250 kil., on March 1st at Pau. He flew on a Morane monoplane, fitted with an engine of only 50 h.p., from 7.56 a.m. until 10.20 a.m. His time for 200 kilometres was 1 h. 42 min. 17 2-5 secs., and for 250 kil., 2 h. 7 min. 54 1-5 secs. (former record 2 h. 22 min. 57 3-5 secs.).

During the past few weeks Mr. James Valentine has been flying the Bristol monoplane almost daily in the neighbourhood of Paris. On February 27th he flew from Saint Cyr to Paris and back, after circling above the Eiffel Tower. The journey out took ten minutes, and the return thirty-five minutes, showing that there must have been a big wind.

Over the tower he got into six remous in rapid succession, according to his own account. He describes the sensation as similar to flying in a vacuum, "quite a nasty sensation." One day the *Adjutant Reau* dirigible, tersely described by Mr. Valentine as "the sausage from Issy," journeyed to Saint Cyr from Issy. Mr. Valentine, accompanied by Captain Bertram Dickson, flew in circles above the air ship, without the crew even knowing he was there, and found he could fly round and round with ease, while the dirigible was making her best speed.

Mr. Valentine was visited frequently by Mr. Gordon Bell on the new R.E.P. with a 90-h.p. seven-cylinder radial motor. On occasion he returns the visits. Buc, which aerodrome is the R.E.P. headquarters, is only nine kilometres from Saint Cyr.

Paulhan, on March 1st, flew from Juan les Pins to Nice, where he won the Coupe d'Aspremont in 9 mins., alighting once on the water during the flight. He later flew back to Juan les Pins. It is announced that he intends to fly on his hydro-aeroplane from Calais to London, descending on the water once or twice while crossing the Channel. On reaching London he intends to alight on the Thames.

Le Matin, a paper which, from the beginning, has shown an intelligent interest in aviation—an interest which it demonstrated by the presentation of valuable prizes for certain useful flying competitions, has during the past few weeks opened a subscription list towards a fund with which to buy

aeroplanes for presentation to the French Army. The total amount received up to the end of last week was about £28,000. One wonders if the enthusiasm for aviation of the British people would give proofs of its sincerity in this manner. I do not believe the time is yet ripe in England for the making of gifts of any kind to the British Nation. His Majesty's Government has not yet degenerated into a charitable institution, and the making of presents to it is hardly the best method of encouraging initiative.—Pingouin Rose.

The D. G. Gilmour Memorial.

The following subscriptions have already been promised or received for the D. G. Gilmour Memorial:—E. C. Gordon England, £5 5s.; J. Herbert Spottiswoode, £5; Henry Knox, £5; Staple Firth, £3 3s.; the Brothers Pashley, £2 2s.; Howard T. Wright, £2 2s.; T. Sopwith, £2 2s.; G. M. S., £2 2s.; E. W. Edwards, £2 2s.; C. G. Grey, £2 2s.; Harold Perrin, £1 1s.; Frank McClean, £1 1s.; E. T. Willows, £1 1s.; Lieut. C. G. W. Head, R.N., £1 1s.; Lieut. J. C. Bower, R.N., £1 1s.; P. K. Turner, 10s. 6d.; Miss Bacon, 5s.

The late D. G. Gilmour's many friends are asked to send subscriptions, large or small, to any of the Committee:—Messrs. H. E. Perrin (Royal Aero Club), T. O. B. Hubbard (Aeronautical Society), Harry DelaComhe, Eric Clift, Staplee Firth, or C. G. Grey (c/o The Aeroplane).

"98.9"

On the first night of Mr. Robert Loraine's new play at the Criterion, I was informed that it was written by an American, and some said it was by one Farnald, author of "The Cat and the Cherub." Well, if it is by an American, he must be quite a highly civilised one, for the dialogue is not only funny, as most American dialogue is, either intentionally or unintentionally, but it is often witty, which Americans seldom are, either verbally or on paper. Still, I can believe in its American origin, for somehow it reminds me of an American car. The design is excellent, the material is magnificent, it is full of clever little ideas, but somehow it is not well put together, and—as on some American two-seaters—there was a flat projection at the back that did not seem to serve any useful purpose. However, one should not be too critical on a first night, and Mr. Loraine himself explained that it would play much closer after another performance, so probably by now it has been altered a little and generally tuned up, and is running as sweetly as it deserves to do. A good British chauffeur can do quite a lot with even an American car, if he is allowed to take it to pieces and put it together again. As for the general idea of the play, I am still trying to find out whether it is a physiological farce, a comedy of eugenics, a study in stamina, or a mixture of the lot. Anyhow, the first act is farce, and very high class farce at that, the second is really good comedy, and the third seems to be a character study with mechanical interludes; the whole being a wonderful exhibition of the staying power of Mr. Robert Loraine.

I suppose everyone has read all about the plot—what there is of it—in the daily papers, so there is no need to enter into the intricate manœuvres of the egotistical aviator, with propagatory beliefs, in his endeavours to capture the strong-minded young woman who had herself made up her mind to break his nerve and capture him afterwards. After all, the plot is only a clothes-line on which to display some cleverly embroidered mental garments, and it is the embroidery itself that matters most.

Many of the lines are distinctly precious, as, for example, when the aviator-hero produces as one of his credentials, "A photograph of my mother, showing the excellent taste I inherit from my father," and the disapproval of the conventional cousin when he says, "I don't call it maidenly to go climbing about the sky in a mowing machine," by way of reproof to the young woman's admiration of the departing aeroplane.

The aeroplane itself is a thing of joy. One never sees it, but its advent and departure are splendidly managed. The singing of the engine in the distance, the switching off just out of sight over the windows at the back of the stage, the whistle of the wires as it glides down, and the cracking of wood as it alights among the best shrubs in the garden are most realistic, as is the starting up of the engine for the return journey, and the dying away of the sound as the machine climbs up into the blue Mediterranean night. There were several aviators present on the first night, and argument waxed fierce as to the engine the hero was using, though all agreed it was not a Gnôme, as it crackled too much at low speeds, so evidently Mr. Loraine is reforming his beliefs so far as engines are concerned.

The cinematograph in the third act, showing the chase of the heroine through London, pursued by the hero, who is driven by Mr. Gustav Hamel on his long silver 6-cylinder Mercédés racer, was frightfully funny, especially the unrehearsed contretemps with an L.C.C. tram on Westminster Bridge.

As for the people who did the work—Mr. Loraine was as strenuous, as humorous, as fascinating, as hard-working, and as much like himself as only Mr. Loraine can be. The only grievance I had against him was that his aviator's overalls were quite clean after his 100-mile flight to Bordighera. Mr. Vane Tempest, as the girl's cousin, was a perfectly delightful ass. Mr. Cartwright was—well—adequate enough as the heavy uncle. But we did not get nearly enough of the Italian mechanician-valet; there were plenty of excuses for bringing him into the second act, and he did not appear at all till the third. A really clever author would have made him a Latinised version of the one and only 'Enery Straker.

Of the women-folk, Miss Mabel Love, as the girl, must have been a perfect revelation to those who have not seen her capital work in the provinces. Her part was difficult to make really alive, but she did it, and she had plenty of chances of spoiling scenes by a false note, but she did not. The pretty little dancing girl of some years ago has developed into an actress of far greater ability than most of the "leading ladies" who pose and grimace themselves through big parts at big theatres, and now she has had a chance of showing herself in "Town" she ought not to be allowed any more sojourning in the wilderness.

Miss Illington was, of course, perfect as the respectable and managing aunt, with a fondness for old china and a beautiful taste in frocks; but, then, one never expects or gets anything else but perfection from her in her own parts. A sister of Mr. F. E. Smith, M.P., played the small part of the maid, and did nothing in particular very well.

Oh! by-the-way, the play is called "98.9," because the heavy uncle says that the true artist, such as the girl claims to be, has a temperature "three degrees below normal"—presumably he meant three "points," but that is a detail, though human life cannot exist below 97 degrees. However, on test, when she declares, "This is the most ridiculous moment of my life," she proves to have a temperature of 98.9, and so shows herself to be merely a normal person in rather an excited state. Like the Italian *mécano*, the joke is not worked to its full value.

Anyhow, go and see the show for yourself. I can promise you a most amusing evening and some really smart sayings to retail afterwards.—C. G. G.

Art and Aviation.

The International Association of Women Artists is holding, during this week, an exhibition at the Grafton Galleries. Amongst many exhibits of considerable excellence Mrs. R. F. Scott's large statue of the late the Hon. C. S. Rolls stands out with great distinction. Mrs. Scott, it will be remembered, is the wife of Capt. R. F. Scott, R.N., who is at present in command of the British South Polar Expedition.

For the Musically Inclined.

Those aviators who want something in the way of cheerful music to beguile the hours when flying is not possible will find the new two-step, "Off for the Honeymoon," by Miss Carlotta Rowe, quite entertaining. It is tuneful, and it has plenty of swing about it, and it is not difficult to play. Incidentally they will find a considerable amount of humour in the cover, which depicts the weirdest nightmare of an aeroplane ever imagined. It is some consolation that Miss Rowe's design for a two-step is considerably better than her artist's design of an aeroplane.

British Record for Duration with Passenger.

The Committee of the Royal Aero Club has accepted as a British record for duration with passenger Lieut. B. H. Barrington-Kennett's flight of 4 hours 32 min. on February 14th.

The Bristol Flying Schools.

During the past month no fewer than eight certificates have been gained at the "Bristol" schools, and this, considering that during the whole of February flying has only been possible on eleven days owing to the inclemency of the weather, is, indeed, very creditable to both the British and Colonial Aeroplane Company and to their excellent staff of instructors.

Certificates have been gained during the month by the following pupils:—Mr. F. W. Merriam, Capt. Weeding, Lieut. C. T. Carfrae, and Lieut. W. Smith at Brooklands, etc., Lieut. B. Boer, Lieut. C. J. W. Head, and Mr. W. Bendall at Salisbury Plain. The average time taken for tuition works out at about four weeks.

At the time of writing there are fourteen Service officers, together with eight civilians, at the "Bristol" schools.

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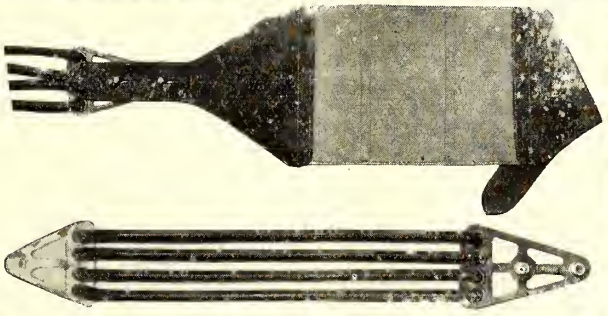

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Italian and Trans-Mediterranean Notes.

As elsewhere, the new 30-h.p. Y Anzani has been distinguishing itself at Somma by setting up a time and distance record. Cobioni, the master pilot of the civil school, on a Somma-built Caproni monoplane, covered recently a distance of 150 kilometres in 2 hours 5 min., the machine carrying fuel for four hours, which a leak in the petrol pipe prevented from being regularly consumed. There was a moderate breeze and the time has since been improved upon. Reduced head resistance and propeller efficiency are the points claimed ever since its infancy for this miniature Blériot-type machine, which Caproni turns out nicely finished and inexpensively for whom it may suit.

I am expecting to visit the new Italian Society, which has acquired the Paulhan-Tatin patents and is opening the old balloon factory outside Milan as their works. The firm have also taken up the Curtiss hydro-aeroplane, for which a neater name might be found—by-the-by, say waterplane even—and are evidently catering for the Government's needs. The latest tale on the tapis attributes rival efforts to the F.I.A.T. Company. When at Turin I heard, too, that Faccioli is building a monoplane, and the Asteria folk talk of fitting their own rotary engines, a variety of the Gnôme family, in view of Government competitions.

From Overseas, I hear that the two repaired dirigibles will shortly be tried at Tripoli, where the high-speed monoplanes are said not to be all that is desired, even for spying out the land, owing to their very fast passage preventing the pilot seeing enough. As is known, practically no machine has been able to do any observer carrying. Higher power machines are greatly needed, and meanwhile the biplane, with photographic outfit, possibly is of more use.

Capt. Piazza is expected back in Italy on leave, which he will, with his usual keenness, probably pass enlightening the home school as to the real thing needed.

The moral effect of the capture by the enemy of a flying machine is so feared that little flying is allowed to the less expert ex-civilians, some of whom have been allowed to return home.

Most machines have felt the climate badly, the rapid falls in temperature and general conditions seem to be playing havoc with wood, metal, and fabric.—T. S. Harvey.

The Aviators in South Africa.

Writing from Johannesburg on February 12th, Captain Guy Livingston, who is managing the tour which Messrs. Paterson and Driver are making in South Africa, says:—

"You have had reports of the flights in the Cape Peninsula, which, with the exception of Paterson's unfortunate accident, were successful in every respect, both financially and otherwise.

"Pat's smash was very unfortunate, and was actually caused by the fabric of the tail splitting and opening, and consequently the machine lost its flying speed and had to come down. He was lucky to get off as he did. His presence of mind saved him, and he shut off his engine, held on by the side struts and threw himself clear when the machine struck.

"We are in Johannesburg now, and I have arranged a flying fortnight here, which commences on Saturday, the 17th inst. Flying will take place three afternoons a week—Monday, Wednesday and Saturday—until the 28th inst.

"Driver made a very excellent flight on Thursday last, the 8th inst., as a result of a bet of mine with the Editor of the Johannesburg *Daily Mail*, as he (the editor) was under the impression, from their previous experiences of aviation here, that it was impossible to get off the ground at Johannesburg. The result was that Driver wheeled his machine out and flew straight away from the course, a distance of about 10 miles, out to Jackson's Drift and back, in all 20 miles, and he reached a height of 1,300 ft. above Johannesburg, which, as you know, is about 6,500 ft. above sea level. This is at present a record for South Africa, but there is no doubt that when Pat and Driver get started it will not stand long."

As the present world's record is some 14,000 ft., there seems no reason why a machine at Johannesburg should not get considerably higher above sea level, seeing that the carburation can be adjusted to start at 6,500 ft.

Congratulations to these three sportsmen who have set out to show South Africa what aeroplanes can do. It is only to be hoped that the South African Government will learn its lesson, and give them adequate reward by appointing them to assist in the military aviation scheme which must be evolved there as in all other countries.

A New Idea in Rotary Valve Engines.

The writer recently had the opportunity of examining a small example of a very interesting engine which has been constructed by Mr. Cochrane, who is well known to those interested in aviation. The engine is a rotary, with a single rotary valve in the cylinder head. By a piece of ingenious design, which it is not permitted to divulge at present, the valve provides a "double seal," and it would also appear to be much more nearly balanced than most.

[N.B.—The Editor regrets that, owing to pressure on space, much interesting correspondence has had to be held over.]

From "The Field."

"Messrs. ANDRE & Co., of Piccadilly, the famous hatters, have produced a special form of headgear for motorists, which we have had under trial for some months. It is called the Dante cap, is made of the finest sheepskin, and lined with pure Nutria fur. In type it resembles the caps of the trappers of Fenimore Cooper, coming down behind and over one's ears so that full protection from draughts and weather is provided. It can be rolled into a very small compass, and is the most comfortable motoring headgear we have ever used." (advt.)

Messrs. Benjamin and Lawton's method of transporting a Bleriot in Cape Town. Mr. Compton Paterson is seen in white trousers, Mr. Drirer with one foot on the step, and Capt. Livingston at the back of the lorry.

MISCELLANEOUS ADVERTISEMENTS

All Advertisements for this column should arrive at this office by 6 p.m. MONDAY, to ensure insertion.
For the convenience of Advertisers, replies can be received at the office of THE AEROPLANE.
Special PREPAID Rate—18 words **1/6**; Situations Wanted ONLY—18 words **1/-**. 1d. per word after.

DOUGLAS GRAHAM GILMOUR, deceased.
The brother and sisters of the late Douglas Graham Gilmour return sincere thanks for all the kindness and sympathy extended to them in their recent bereavement, and beg all their friends to accept this public acknowledgment as, owing to the number of letters received, it is impossible to answer them individually.

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PARTNER WANTED to develop New Design Model Aero Motor. Full particulars, Box 423, c/o THE AEROPLANE, 166, Piccadilly.

Useful Model Work.

MODEL CORRESPONDENCE.

(Correspondents are reminded that space in these columns is strictly limited, and are therefore requested to make their communications as terse as possible.)

Sir,—I have read with much interest and surprise the article on "The Folly of Model-makers," by P. K. T., and I feel as a model-maker and experimenter of motors and aeroplanes that I must take the side of the model-maker. I mean in this that P. K. T.'s attitude toward the model-maker is after the method of the Air Battalion towards officers outside the Royal Engineers, very one-sided and look after ourselves and nobody else.

This Person says that there is no skill in model-making. I say there is. For instance, take Mr. J. J. Rolfe's aeroplane in the February 8th Aeroplane, and see if there is skill or not. From what I can see there is something great in this model which could not be obtained from the model on page 143 in the same paper. He also mentions that scale models should be left to professionals, who do the work really well. I should say one-third of them do not know how to use tools.

Now I speak as an experimenter, so I know what I say in this line. Can P. K. T. (I do not know what part of the aeroplane business he is engaged in) tell me how men get to be professionals? I say if a thing is not made to scale it is not a model. Talking about scale models being relegated to South Kensington Museum is all rubbish. When a model is made by me it is brought to some use, not put under a glass case; that sort of work will not put England in its place in the aerial world.

I expect a person writing in a paper to explain what he means. P. K. T. shows how to get the efficiency of a machine; would he not do better if he would substitute figures in place of using the word "certain" so often? In talking about propellers, can P. K. T. get the recognised horse-power out of an engine with any size of propeller? Can he tell me what action a propeller turning anti-clockwise has on a machine? He also mentions that twin opposed propellers should not be used on models because there are very few full-sized machines use them. Can he tell me what effect twin opposed propellers have on a machine? In a case where they are not used I think it is necessary to try them. There must be some good about them or Messrs. Short Brothers would not have taken so many patents out on them.

In connection with the competition, why not make it necessary to rise off the ground like a full-sized machine, and do a distance in the presence of the representative of The Aeroplane, or send the models up?

If I had not been in my position I would have gone in for this competition, but business holds me back.

The machine which you will hear more about later, constructed by myself to experiment with, will rise from land or water and be driven by one of the type of motors made by myself, like the motor worked by carbonic acid gas advertised some weeks ago.

I do not think it right that young minds should be filled with such articles as "The Folly of Model-makers." I have made models of all sorts—I mean scale models—which will do what the full-sized machine will do. I shall forward a paper entitled, "The Use of Model-making" shortly for your paper.

Bury, Colne. Wilfrid Nuttall.

Sir,—We have pleasure in informing Mr. R. T. M. Haines that we have never at any time authorised the selling of "Mann" standard propellers of 8 in. diameter, with flat blades, and a tip blade angle of 39 degrees! If such propellers have been sent by our agents, it was without our knowledge and sanction, and will certainly never be repeated. Our standard screws have a diameter of 9 in., with curved blades, and a tip blade angle of 45 degrees. With regard to their practical utility, we cannot do better than quote the opinion of Mr. R. Leadbeater, 38, Hurlingham Road, S.W., who says: "Your propellers gave wonderful results at the first trial, and must be by far the most efficient on the market."

Surbiton. Mann and Grimmer.

Sir,—I have been extremely interested in the series of articles on "Useful Model Work," by Mr. P. K. Turner, which have appeared to date in your valuable paper, and more particularly in the notes on proportional models.

Were it not that the results of certain experiments made by myself recently are considerably at variance with some of his deductions, I should not even now have rushed into print. I also thoroughly believe in the value of models in testing new forms of fliers, always provided they are scientifically built. Although the said experiments were made most carefully, I am quite aware that I may be in error, and am therefore open to correction.

In the article in question, on page 94 of the current volume, Mr. Turner states and proves that in proportional models the propeller diameter and pitch both vary as N, where N is the linear scale of the model. Thus, if one model has twice the span and is twice as long as another, all other conditions as set down being complied with, the propeller of the larger machine must have twice the diameter and twice the pitch of that which successfully operates the smaller machine. Further on it is shown that the number of strands of elastic required for the larger machine are N^2 times those used successfully in the smaller.

It is here that I entirely disagree. In the tests referred to above, an account of which is shortly to be published, a series of propellers of varying diameters and pitches were run on elastic skeins of varying proportions, with a view to finding, if possible, some definite rules for the design of model power plant. The static thrust and duration of run were carefully measured in each case, means of several readings being taken.

To reduce the present argument to figures, we will suppose that the smaller model is successfully driven by a pair of $3\frac{1}{2}$ in. propellers, each operated by a skein composed of two strands of 1-16 square elastic chord. This model I have at present before me, and it is capable of flights of over 200 yards. The mean absolute speed of these propellers, when the skeins are fully wound, is about 20 m.p.h., giving a flight speed of 15 m.p.h. Say I wish to make a model double this size. As has been said, I must use a pair of 7 in. propellers of twice the pitch, and mean absolute speed must be $20 \times \sqrt{2} = 28.28$ m.p.h., and the flight speed 21.2 m.p.h. Mr. Turner says that the number of strands of elastic required for these propellers will be $2 \times 2^2 = 8$ per skein; but, according to my experiments, a 7 in. propeller on an 8 strand skein will only give a mean absolute velocity of about 14 m.p.h., and in order to secure 28.28 m.p.h. the skein must consist of no less than 18 strands.

In a similar manner the thrust obtained with Mr. Turner's skein will fall very far short of the required thrust.

I have taken the velocity figures only because in my experience this is the most difficult factor to obtain in model construction, and also because a propeller of a certain diameter on a certain skein will always give the same velocity, no matter what its pitch, provided the projected blade area is constant, and skein is wound the same number of turns each time. Before proceeding to show what effect this increase in the skein will have upon the other items in Mr. Turner's schedule, I should like to have his comments. I do not ask him to take my word for the above statements, but if he can spare the time I should like him to try two propellers and skeins—one set to his figures and one to mine.

Bristol. Ernest E. Vessey.

FABRIC AND COVERING.

Having now dealt at some length with the building of plane-frames, I will pass to the question of covering.

Planes built of piano-wire can be covered in two ways. One is as follows: The frame is placed on a sheet of stiff paper, and the paper marked and cut out to its exact size. From this paper pattern is cut the fabric, which is then hemmed, preferably by a lady friend. After hemming, it will be about $\frac{1}{8}$ in. all round smaller than the frame. It is then laced (with a needle and fine thread) to the frame, care being taken to place it *above* the ribs. In lacing, see that the fabric is stretched as tightly as possible from end to end of the plane, and not too tightly from front to back, as the latter would cause it to lose camber between the ribs. As a matter of fact, it is impossible to prevent a certain loss of camber, but this does not matter, as the fabric will bag slightly under the pressure of flight, and so get its correct camber.

For this method of covering it is immaterial whether the fabric is ready-made, or "doped" after making up. Personally, I prefer a method which combines the advantages of both, and which I will describe later.

The second method is applicable to "tin-ribbed" frames also. A pattern is cut as before, but this time not to exact

size, but somewhat larger. The amount of overlap must vary with the size of the spars. It must be such that the fabric, when folded over, has about ¼ in. or ⅜ in. for sticking down. When the piece is cut out, it must be marked (from the smaller pattern) with the exact size of the plane, and, wherever the edge of the latter is curved in plan-form, the fabric must be slit down to the line, to avoid bagginess when folded over. It is then placed on the frame in its correct position, and pinned in one or two places to hold it firm, after which the overlap can be carefully stuck down.

Planes made with built-up ribs must be treated rather differently. The fabric must be cut to such a shape that it covers top and bottom, and leaves about ¾ in. overlap. It will be observed that the overlap comes on the line of the front spar, and underneath the plane. The adhesive is first applied to the underside of the front spar and the front ends of the ribs. The plane is laid down wrong side up, and the fabric placed on it and neatly pressed into place. The plane is then turned over, the upper side covered with the adhesive, and the fabric folded over it, care being taken that it lies evenly. The rear part of the under side is then treated in the same way.

I referred above to a special method of treating the fabric. This is the one which I myself use, and think it quite above any other. The fabric is first stretched on a frame—an old picture-frame will do—getting it fairly tight and even. It is then painted on both sides with very hot thin size, unless the fabric is very thin, in which case one coat will do. The size will dry in about two hours, and the fabric is then ready to apply to the plane. The adhesive used is not glue, but size, which is much cleaner and easier to work with. When the whole plane is finished, it is given at least two coats of thin celluloid varnish. The latter can be obtained of any varnish-makers, but will probably have to be thinned down. This can only be done with amyl acetate, which should be bought of a chemist.

Fabric treated in this way is water, oil, and petrol proof, and excellent in appearance. It also has the advantage that, owing to the "body" given by the preliminary sizing, the very flimsiest of material can be easily dealt with.

Anyone who has had to wrestle with thin untreated Jap silk, for example, would almost envy Jacob in his little affair with the Archangel; whereas I myself have most successfully used chiffon, the flimsiest of all stuffs, which, after treatment, rather resembles the net-woven glass used for motor-screens. It weighs about ⅞ oz. per square yard, after two coats of varnish on each side. It must be noted that very few fabrics will take celluloid varnish direct, while all will take size; also that, while the size shrinks considerably, the varnish does not; so that, while the stuff must not be too tightly stretched over the sizing-frame, the sized fabric must be carefully and tightly stretched over the plane. P. K. T.

CLUB NOTICES.

N.B.—Club Notes must be posted to 166, Piccadilly, to arrive not later than first post Monday morning, and should be as brief as possible.

Paddington and Districts Aero Club (1910).—Inter-club duration contest, Ealing and District Club, March 23rd. Juniors' and novices' competition March 30th. Tests for certificates—Superior class, distance ½ mile, duration 100 secs. Separate flights, 1st class, 1,000 ft. and 50 secs.; 2nd class, 500 ft. and 25 secs. No flying Parkside Saturday. In evening Mr. Canning lectured, accompanied by diagrams, on why aeroplanes are stable or unstable, laterally and longitudinally. Stability of the Dunne and Weiss type machines also explained. March 9th, at workshop, reception by President (Mr. V. E. Johnson, M.A.). Attendance of members requested.—W. E. Evans, Hon. Sec., 133, Buchanan Gardens, College Park, Harlesden, N.W.

Bristol Model Flying.—March 2nd flights by Howse, Easterbrook and others. Meetings held fortnightly after meeting at Sea Walls 3 p.m. March 9th.—R. V. Tivy, Hon. Sec., 5, Royal York Crescent, Clifton, Bristol.

Brighton and District Aero Model Club.—Fine flying by Bate in high wind on 2nd. Did about 800 yards. Flying next Saturday at Shoreham. Communications to Hon. Sec., A. von Wichmann, "Kingsleigh," Kingsway, Hove.

Stony Stratford and District Kite and Model Aeroplane Club.—Exhibition of models, kites and accessories held at Baptist Schoolroom, February 29th, when members and general public present. Members attempted to try machines, but owing to collisions with visitors and other miscellany, deemed it prudent to close this feature. Entries as follows:—Monoplanes 17, biplanes 4, kites and accessories 21; 37 staged. Next meeting March 14th, at 8 p.m.—O. Hamilton, Junr., Sec., Old Stratford, Stony Stratford.

Aero Models Association (N. Branch).—Saturday last A. Haulberg, R. L. Rogers, E. R. Brown, Brosse, Taplin, Root and Partridge flying. Eight Boy Scouts up for aviators' badges. Competition for distance March 16th at Finchley for "Mann" set of parts. Open and no entrance fee.—Malcolm B. Ross, Hon. Secretary.

Ealing and District Aero Club.—Saturday Messrs. L. Roche, Chilcott, J. Pratt, G. Beeching, and L. Kirchner were flying. The Mayor of Ealing (Councillor Taylor) has consented to be club's president. Paddington Club contest 23rd inst.—B. J. Kirchner, Hon. Sec., 1, Queen's Gardens, Ealing, W.

Blackheath Aero Club.—At Grove Park, Messrs. A. B. Clark, H. Pizey, A. E. Egelstaff, F Jarvis and A. E. Woollard flying. At Kidbrooke, Messrs. Slatter, Williams, Hock, J. Peter, Brown and Cartwright. At Lee, Messrs. J. H. Dollittle, F. Peter, Whitworth, Hock and Richards. Next Saturday at Kidbrooke, "point-to-point" competition for club members, 3, p.m. W. H. C. prize will be awarded to junior or novice who makes best duration flight during week ends in March and first two in April Information Bureau, for club members, inquiries must be accompanied by stamped and addressed envelope. All particulars from H. E. Woollard, Hon. Sec., 48, Hafton Road, Catford, S.E.

Hackney and District Aero Club.—No flying Saturday! Steering and stability contest next week. New members heartily welcome.—B. H. Longstaffe, Hon. Sec., 47, Jenner Road, Stoke Newington, N.

Birmingham Aero Club.—Saturday, little flying. Next day Messrs. Vale, Trykle, Lunn, Baker, Rogers and Mason flying.—G. Haddon Wood, Joint Hon. Sec., 8, Frederick Road, Edgbaston.

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THE AEROPLANE

1d WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

VOL. II. [Registered at the G.P.O. as a Newspaper.] THURSDAY, MARCH 14, 1912. No. 41.

A REMINISCENCE.

The late Mr. D. G. Gilmour flying at Henley. The appreciation of the crowd may be noticed. This and the other photographs of Mr. Gilmour in this issue were taken by an unknown friend, who sent the negatives to Mr. Gilmour, who, only two days before his death, desired that they should be given to "The Aeroplane."

Mr. C. Grahame-White's opinion of Chauviere's "Integral" Propellers:—"This is the one I always use; what more could I say?"

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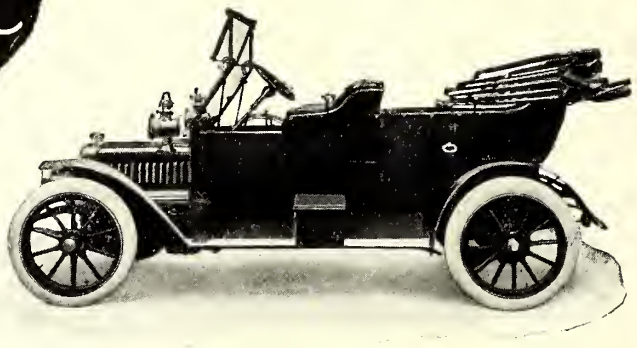

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MATTERS OF MOMENT.

COLONEL SEELY AND SERVICE AVIATORS.

Colonel Seely's statement on Aerial Defence was made too late to be dealt with in detail in the last issue of The Aeroplane, so that his remarks have perforce had to be left without comment until to-day. Though Colonel Seely is undoubtedly fully convinced of the importance of an adequate Air Corps for this country, and though whatever expansion takes place during the forthcoming year may be attributed almost wholly to his energy and foresight, it is only too painfully evident that he is not so fully conversant with the subject as one could wish.

Of course, one can scarcely expect the Minister concerned with all the ramifications of our complicated Army system to be thoroughly in touch not only with the theory and practice but with the spirit of aviation, so much may be forgiven him; and we must be duly thankful that we have, at any rate, one Minister who realises the importance to our national welfare of the new arm.

Certain of his statements seem rather to contradict themselves. For instance, he stated that, "In a purely land war the whole flying corps will be available, and in a purely naval war the whole flying corps will be available for naval war." Yet a little further on he said that after undergoing the course of school work on Salisbury Plain "an officer will either join the military wing or the naval wing."

Now it is fairly obvious that an aviator taken from the military wing would be very little use for deep-sea air-scouting. In the first place, not being a sailor, he would probably be too seasick while on board ship to be physically fit to handle his machine at all; and, in the second place, he would naturally not have had the right training for that particular work. Of course, this latter defect may be remedied to some extent by the scheme of training which is to be organised on Salisbury Plain, for Colonel Seely said that "officers attached to the Central Air School will learn progressive flying" (which somehow suggests progressive bridge), "mechanics, and construction in all its details, meteorological observations of the air, navigation and flying by compass, cross-country flights, photography from the air, signalling by all methods, and, most important, *the types of warships of all nations.*"

The idea of sixty military officers solemnly sitting in the solitudes of Salisbury Plain studying the designs of warships is almost too humorous to be taken seriously, but perhaps this particular instruction will be given from picture books on wet and windy evenings. It is sincerely to be hoped that the standard handbook on the subject, which will presumably be entitled "Warships of all Nations," will be somewhat more accurate than a work published not long ago purporting to illustrate all the world's aeroplanes.

It is also somewhat unfortunate that Colonel Seely, in spite of his war service, should have adopted in his speech a literary style strongly reminiscent of the halfpenny Press. His objection to the excellent and now universal word "aviation" as a "detestable word," which he hopes "may for ever be banished from the English language," calls for little comment, especially as in response to Mr. Joynson Hicks' request for a substitute he was unable to make a suggestion. Possibly the denizens of Carmelite Street would like him to introduce the word "air-manning" in its place.

His description of Commander Samson, R.N., as one "whose exploits are familiar to the House as a daring sailor in the air," is scarcely likely to be so fully appreciated by the subject of the remark as is the good intention which prompted it. No one realises the fact that aviation work is risky more fully than those who are engaged on it, but the average man in the Service does not care to be told that "all officers will be treated alike because they will run the same risk, and have the advantage of doing the same daring deeds." Such phrases may be all very well in an election speech, but they are not convincing to those who know anything of the Services.

As a matter of fact, Colonel Seely seems to be obsessed by an exaggerated idea of the dangers of aviation, for in talking of the scale of payment and pension for officers of the Air Corps he said, "I may take it I may rely upon the House for every assistance in this matter, if for no other reason than that of the dangers in this business," and "the risks these officers will run will be very great."

COLONEL SEELY AND BRITISH MANUFACTURERS.

Incidentally, Colonel Seely, erring, no doubt, entirely in ignorance, gave voice to what is in truth nothing more or less than a libel on British manufacturers when he said of the numbers of machines to be purchased, "Not so many have been ordered from British manufacturers as we could wish, but that is because the technical members of my committee, themselves flying men, realised with the full approval of the whole committee that the first essential was efficiency and safety, and it is a fact that in many respects France has gone a long way ahead of us. We could not buy British machines—neces-

sary though it is to encourage British manufacturers, because we cannot obtain machines for use in time of war—at the price of human life, and therefore we had to reduce the number of orders we had originally hoped to give to British firms. . . . It is some consolation to know that in France they have enormously increased the safety of learning to fly. I know one particular school where they have covered 60,000 kilometres without accident of any kind, and there may be others that will show similar records as good or almost as good."

The whole of this statement is, unfortunately, inaccurate and misleading. Taking them all round, British machines are considerably better built, of better material, than any but a few of the very best Continental machines, and only two cases are on record of British machines having broken in the air with fatal effects. In one of these cases it was practically proved that the machine was being subjected to unfair treatment, which no machine could be expected to stand; in the other the cause of the accident remains almost a complete mystery. In no other accident with a British machine, fatal or otherwise, has a machine been known to go wrong in the air, even in matters of detail, except through sheer negligence, not on the part of the constructor, but on the part of the pilot or his mechanics.

On the other hand, there have been several cases of fatal accidents in France, Germany and Italy through machines breaking or getting out of order in the air. There was the accident to Wachter at Reims, and to Laffont and Pola at Issy. There was Cammarota's accident in Italy; there was Lieut. Ducourneau's smash at Pau only a fortnight ago; there was Schlegel's at Johannisthal late last year; there was Lieut. Lantheaume's early this year. There was Chavez's at Domodossola; there was Desparmet's in the Military Trials at Reims; there was Lemartin's at the start of the "European Circuit"; there were Captain Camine's and Lieut. de Grailly's near Buc; there was Delagrange's at Croix d'Hins, and others. These, it should be noted, are only the fatal accidents. Many also could be quoted which resulted merely in serious injury, and in some cases the pilots have even been fortunate enough to escape unhurt. But how in the face of these figures it can be asserted that British machines are any less safe than machines of foreign construction must pass the comprehension of anyone who has a fair working knowledge of both British and foreign machines of to-day.

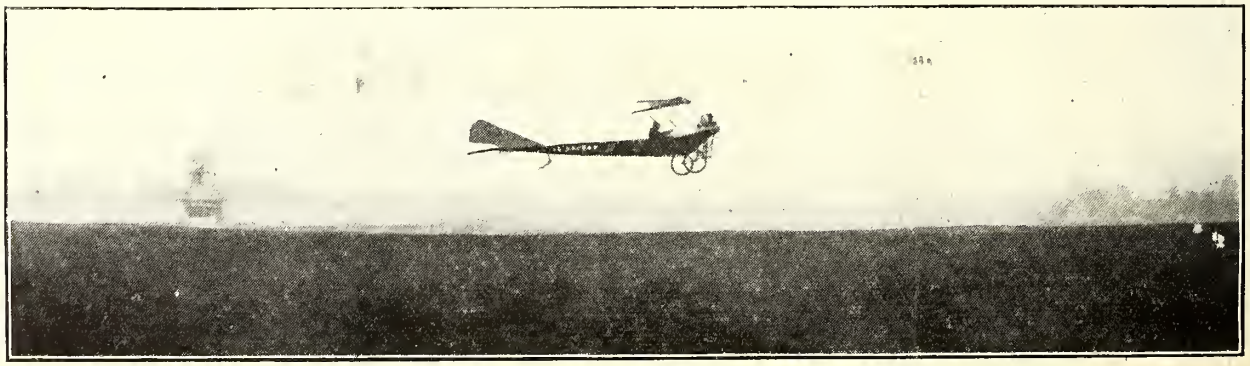
The statement that at one particular school 60,000 kilometres have been covered without accident is, even if accurate, absolutely no proof of anything at all. The school referred to is presumably a biplane school at Mourmelon. All credit is due to the principal of that school for the exceedingly cautious way in which he conducts his school work. If pupils are never allowed out when there is a breath of wind blowing, and if they are carefully instructed to fly in the manner affected by the principal himself, who, except on a few occasions when he has been tempted in competition to exceed his habitual height, hardly ever rises to a greater altitude than, say, thirty or forty feet, one can absolutely understand that serious accidents are avoided. But this method of flying does not produce pilots of the first class.

On the other hand, schools equipped with machines which are known to be stable in quite considerable winds naturally produce more accidents, because the pupils, having faith in their mounts, simply open up their engines and sling themselves into the air at top speed, trusting to the proper design of the machines for their safety, even when the wind is blowing. As a matter of fact, French aviators visiting this country express their surprise at the way our mere pupils go out in winds, or in sunshine which causes heat-gusts, when only the most experienced French pilots would venture off the ground at all.

However, it is certain that Colonel Seely has been misled by the person who told him of the 60,000 kilometres without an accident, for that distance is equivalent to about 38,000 miles, or over 100 miles every day of the year. Even the biggest of schools can scarcely have put up such a mileage in the past year, whatever one or two schools may be doing to-day, and it is more certain still that no school has existed for a year "without accident of any kind." The statement is incredible on the face of it.

The inference that the purchase of British machines involves a sacrifice of life which can be avoided by the use of foreign machines is a gratuitous, even if unintentional, insult to British manufacturers, though it may be excusable in the majority of the Committee responsible for it, owing to their complete ignorance of their subject, or owing to their knowledge being confined to the only original machine built by the Army Aircraft Factory—or the Air Corps Factory, to give it its new name—a machine which cost the life of Mr. Theodore Ridge; but one cannot explain such sentiments from General Henderson, Commander Samson, R.N., or Lieutenant Gregory, R.N.

It is true that General Henderson's personal ex-



A Neat French Machine.—The little Danton biplane, with Viale engine, at Juvisy. Note the staggered planes.

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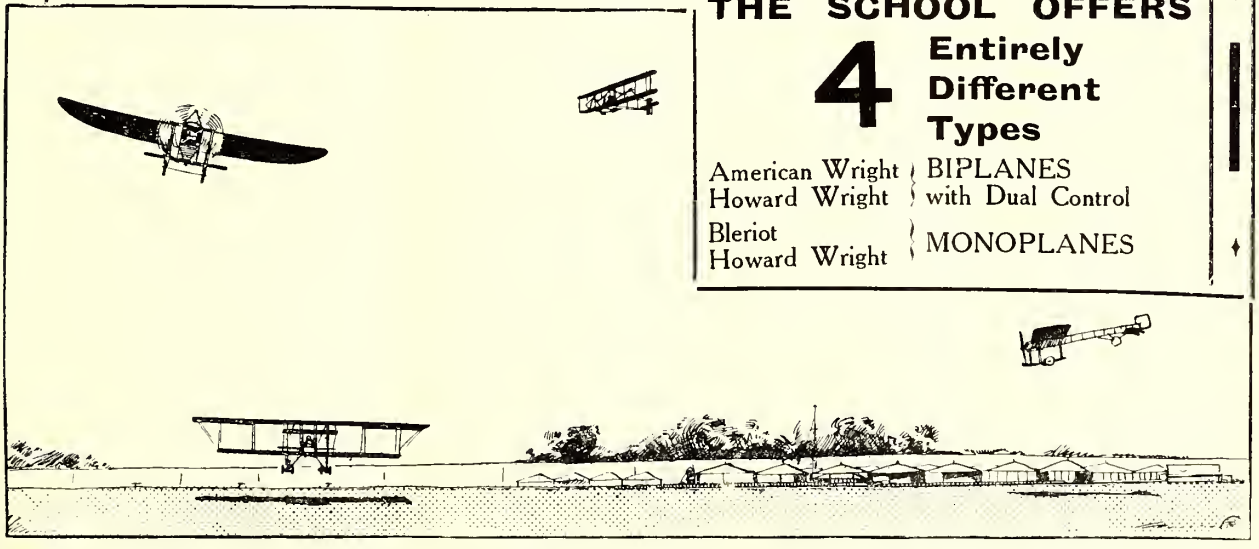

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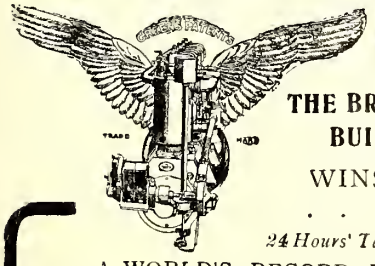

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perience has been confined to the obsolete, inefficient, and dangerous box-kite type of biplane, but those he has flown have been among the best of their kind, and very much superior to their foreign prototypes. If a certain landing which General Henderson once made at Brooklands, after meeting with the wash of another machine, had been made on a foreign-built machine he would very probably by now have been among the victims of aviation instead of among the adverse critics of British constructors.

That Commander Samson and Mr. Gregory should subscribe to such opinions is more extraordinary still, if indeed they were actually in agreement with the rest of the Committee, for the particular machines they have always used are absolutely unapproached by any foreign make of similar type for pure workmanship and strength, and though their flying experience has been confined almost entirely to that one make, they have at any rate seen other British as well as foreign machines at close quarters and are able to judge well enough, even though neither of them is by profession a trained engineer.

The writer has the greatest personal regard for both these officers, and has immense respect for their ability as aviators and as judges of aeroplanes, so it is the harder for him to believe that Colonel Seely can possibly have correctly understood their sentiments on the relative merits of British and foreign machines.

The Air Corps scheme, as a whole, contains many excellent features, notably, as Mr. G. J. Sandys, M.P., pointed out in his very able speech, the delivery of the Air Corps from the bondage of the Royal Engineers, but in its unfair treatment of British aeroplane constructors, in its lack of any encouragement to British engine builders, in the waste of money on balloon sheds, in the purchase of wholly unnecessary land, in the mixing up of sailors, soldiers, and civilians, and in the formation of the Committees which evolved the scheme, it quite justifies Colonel Seely in saying, "We must have made a great many mistakes, and there must be a great many omissions." In this respect the statement of the Under Secretary for War is absolutely accurate.

A Defender of the "Factory."

A contemporary journal also dealing with the subject of aeronautics has in its pages this month some observations on military aviation, especially prepared "by one in high authority," which are in essence a defence of those methods of the War Office which seem to be inspired by the officials of the Air Corps Factory and an attack on critics such as The Aeroplane.

The substance and quality of the article are sufficient proof that the writer has only a very rudimentary knowledge of Army practice. The method of argument is that of a sapper, and might well have been employed by a civilian engineer intimately connected with that branch of the Service.

The writer of the article, who, of course, conceals his identity after the manner of the ostrich that hides its head in shame, complains that all the criticisms of the War Office are "destructive" and not "constructive." This, it need hardly be said, is the time-worn formula of attacked officialdom, and is sometimes correct, but it does not apply to the case in point. Any criticism of the present state of Army aviation supplies the obvious alternative—buy machines and organise—and is therefore distinctly constructive.

The writer of the article mentioned, whose ignorance of contemporary thought in regard to military aviation appears to be colossal, says that, whilst it is obviously desirable to purchase aeroplanes, the War Office is restricted in its expenditure by the Treasury. And yet we have that writer's official chief, Lord Haldane, definitely stating in the House of Lords that he was *not* hampered in aerial matters by want of money.

Deliberate misstatement of fact appears to be habitual to the writer of the article, for he speaks of the two large dirigibles "which were literally forced upon the authorities by people who meant well, but ought to have known better." One cannot remember any agitation of importance by anyone possessing any knowledge of the subject that could be construed into "forcing any action on the Government," and, in any case, the dirigibles would have been good purchases if they had been up to the standard of their period. The blame rests with inefficient officialdom for accepting badly designed and badly made machines.

That the expense attached to the acquisition of aeroplanes for Army purposes ends with the purchase price is so manifestly absurd a view that one cannot believe that it has been held seriously. On February 1st, in these pages, I wrote an article pointing out the large expenditure required to maintain an air corps satisfactorily.

Later, in the article quoted, its authoritative author upholds the view that the Royal Engineers are best qualified to control the air corps because apparently they have some scientific knowledge. When will people of the class of that writer realise that the aerial force must exist for the purpose of reconnaissance and not for constructional experiments and engine-driving? The sappers are undoubtedly of use so far as the maintenance of the aeroplanes is concerned, but the author's knowledge of the conditions regulating the employment of R.E. officers is apparently not extensive.

A defence of the Air Corps Factory on points that have never been attacked concludes the article. None has any objection to the factory acting as a laboratory for experimental research and as a repair depot for Army machines

He says nothing of the employment of civilians to supervise the activities of the factory. The sappers he defends so bitterly could easily supply officers capable of such duties. One hopes that the cause of military aviation will have better and more honest supporters than is the writer of our contemporary's article, whose sole object seems to be to attack other writers not in agreement with himself and his personal interests.—W. E. de B. W.

The D. G. Gilmour Memorial.

Very satisfactory progress is being made with the D. G. Gilmour Memorial Fund, and the way in which subscriptions have come in without any direct requests to individuals shows the high esteem in which our dead friend was held. A subscription book has now been opened at Brooklands, and this is in charge of Mrs. Handasyde, who will be glad to receive donations large or small towards the fund from those who knew D. G. personally, or who, having only seen his wonderful demonstrations of flying, feel they would like to help in perpetuating the memory of one of the finest fliers we have yet seen, and one of the real pioneers of aviation. Readers of The Aeroplane are reminded that the shillings of the less well-to-do are quite as great a tribute to his memory as are the larger sums of those more blessed with worldly goods.

The following sums have been already subscribed:—E. C. Gordon England, £5 5s.; J. Herbert Spottiswoode, £5; Henry Knox, £5; W. B. R. Moorhouse, £5; Staplee Firth, £3 3s.; the Brothers Pashley, £2 2s.; Howard T. Wright, £2 2s.; T. O. M. Sopwith, £2 2s.; G. M. S., £2 2s.; E. W. Edwards, £2 2s.; C. G. Grey, £2 2s.; C. G. Grey (senior), £2 2s.; Fred May, £2 2s.; Lieut. C. G. W. Head, R.N., £1 1s.; Lieut. J. G. Bower, R.N., £1 1s.; Howard Pixton, £1 1s.; R. N. Mess, Eastchurch, £1 1s.; E. T. Willows, £1 1s.; Harold Perrin, £1 1s.; Eric Clift, £1 1s.; Frank McClean, £1 1s.; P. K. Turner, 10s. 6d.; Miss Bacon, 5s.; J. Furley Smith, 5s. The total sum being now £49 11s. 6d.

Subscriptions may be sent to any of the Committee:—Messrs. Harold Perrin (Royal Aero Club), T. O'B. Hubbard (Aeronautical Society), Harry DelaCombe, Eric Clift, Staplee Firth, or C. G. Grey, 166, Piccadilly, W.

A Logical Deduction.

A correspondent of a logical turn of mind is anxious to know by what process of reasoning Colonel Seely, having arrived at the conclusion that British-built aeroplanes are dangerous, considers this an excuse for only buying a small number of them. If Colonel Seely's statement is accurate, then it is a reason for buying none at all, but it cannot possibly be a reason for buying a few.

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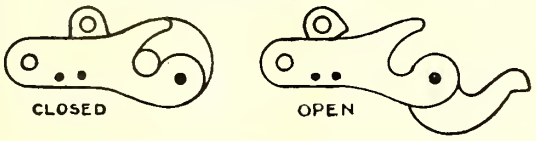

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A Criticism of the Air Corps Scheme.

BY W. E. de B. WHITTAKER.

On the evening of March 4th the Under-Secretary of State for War (Colonel Seely) made his eagerly expected statement on the steps to be taken during the coming financial year to extend the aviation section of the British Army.

For two years we have waited for adequate provision to be made for the formation of a strong and efficient aerial force, while foreign nations with whom we have to count in order to preserve the "balance of power" have appreciated the value of aeroplanes and have spent large sums in aid of military aviation.

The sum allotted in the Army Estimates for this purpose was not totally inadequate in size, but nearly half of it was ear-marked for expenditure on things not essentially connected with aviation. Such money as was ostensibly devoted exclusively to aeronautics appeared in the Estimates under vague headings, and Colonel Seely's statement was necessary before any conclusions could be formed.

The statement was distinctly disappointing. Its terms cannot please anybody save the members of the Committees which advised the Under-Secretary, and possibly the Navy. The general principles of the scheme laid down are unsound, and the details are only in a few cases open to approval.

The Mixed Personnel.

To take the broad statement first, that "there is to be one flying corps embracing soldiers, sailors, and civilians, all who can fly and who will undertake the obligation to serve their country in time of war in any part of the world." It is insulting to the Army and Navy that Colonel Seely and his Committees (one must always remember that the Committees take the blame for all that may be wrong) should decide that there is not, in either of his Majesty's Services, a sufficient supply of gentlemen willing to take the risks so glowingly depicted by Colonel Seely and capable of becoming efficient aviators. It is considered necessary to enrol civilian aviators as part of the national air corps, an excellent example of the spirit of compromise so dear to the policy of the present Government.

Those who have had most experience of corps assembled in this manner will agree as to the great difficulty of obtaining harmonious co-operation between the representatives of the different sections engaged.

This corps is to have headquarters on Salisbury Plain on land purchased out of the Army vote, and at a military station. The majority of the machines purchased will be at the expense of the Army. Even after the extended course of aeronautics for which the school on Salisbury Plain is designed, the members of the naval wing are drafted to Eastchurch, whilst the military wing has for some time to come to remain on the Plain.

The Fitness of the Committees.

Perhaps the reason of this is that, while the Navy was represented on the Committees by two naval aviators of considerable ability and experience, the Army was represented by two general officers and one civilian engineer.

How was it that no officer of the Aeroplane Company, Air Battalion—a company which had in it aviators of at least as much ability as any of the naval aviators—had a seat on either Committee?

That Colonel Seely, who is not without war service, should gratuitously insult the Army in his actions and in his official declarations is a matter of surprise even to those who hold pessimistic views as to the public morals and personal intellect of his Majesty's Ministers.

Amphibious Duties.

Colonel Seely said that the entire corps might be employed at sea in a purely naval war, or on land in a purely land war. Does he seriously imagine that the average naval officer's knowledge of the principles of strategy and tactics and of the appearance of the different arms of the service is sufficient to make him a military scout of any value, or that the soldier's picture-book knowledge of the Navy qualifies him to act as a scout at sea and to collect news of value as to numbers and power and formation of the enemy's fleet? As to the civilian, his limitations are obvious, and it is presumably only intended to employ him as a pilot under the control of a naval or military observer.

As an indication to foreign armies of the strength and extent of our national Air Corps, it is courteously laid down by the War Office that all officer aviators shall take the pilot's certificate of the Royal Aero Club.

Organisation.

The military wing of the Air Corps is to consist of seven aeroplane squadrons of twelve aeroplanes apiece and a sufficiency of pilots. The eighth squadron consists of balloons and kites. As to the balloons, Colonel Seely cryptically states that it is intended to use "the present free balloons so long as they last, and possibly longer."

The Question of Transport.

There is nothing to criticise in the size of the squadrons, but no mention is made of a transport organisation for the aeroplanes concerned. Whatever may be intended, no adequate provision is made in the Estimates for the purchase of motor-driven cars and wagons for this purpose. For this and other reasons of finance it is unlikely that the Air Corps will be prepared to take its place in the Expeditionary Force for another two years. Perhaps bellicose Continental nations will refrain from creating disturbances until Great Britain is better prepared for the rigours of war. The chivalry of the strong for the weak may possibly stay their hands.

Civil Schools

As I suggested last week, it is intended that officers should learn the rudiments of flying at the civil schools before proceeding (if selected) to the great military and naval centre on Salisbury Plain. As so few officers can be trained on the sum granted for this purpose, it is, perhaps, intended that they should all take their preliminary instruction in civil aerodromes. It is of importance that the Army should, as far as possible, be self-contained; but circumstances alter cases, and it may be better policy to support the civil schools at this critical stage of their career than that the service should remain inside its own ring-fence.

The Demise of the Air Battalion.

The Air Battalion is dead, and save for the sappers few will mourn its early demise. It has served its purpose in showing the utter inadequacy of our aerial defences. The Aeroplane Company, at any rate, had efficient officers and men, and it is to be hoped their services and merit will be recognised when the staff of the new Air Corps is formed. The position of the Commandant on Salisbury Plain is to rank, roughly, with that of the Commandants at Sandhurst and Woolwich. He will thus be paid less than the Superintendent of the Air Corps Factory, and will be only of the rank of colonel. This, more than anything else, shows that aviation still holds a secondary position in the views of the civilian chiefs at the War Office.

The Waste of Money on Land.

The £90,000 to be paid out of the aviation grant of £308,000 for the purchase of 4,000 acres of land (working out at more than twenty years' purchase) is wasted money so far as the Air Corps is concerned. In a reply during the debate on the Army Estimates (March 6th, 1912), Colonel Seely says that "we did badly want an extension of ground in the neighbourhood of Salisbury Plain," and admits that other troops will use it. Why, then, did this £90,000 come out of an already inadequate vote? Ought it not rather to have formed part of Vote 10 (Works and Buildings) as a purchase of land for the general purposes of the Army, instead of being added to the aviation account so as to make it appear a large and adequate sum?

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Absolute Inadequacy.

In his statement Colonel Seely said that the Army would probably purchase 131 aeroplanes and train 180 officers. The most careful sub-division of the money only leaves about £80,000 for the purchase of aeroplanes, and it was therefore, apparently, suggested that this sum would purchase 131 machines. On being questioned, however, the Under-Secretary admitted that he thought that only a fraction of this number could be purchased during the coming financial year. If so, it is deliberately misleading to refer to the larger number of machines, as that cannot possibly concern this year's Estimates.

Unfortunately, it seems to suggest that it is the intention of the War Office to confine the military wing of the Air Corps to 131 aeroplanes as a total number. This in the light of the plans of other nations. And economy is no excuse, as some months ago the Viscount Haldane, in a speech, stated that the Treasury had placed no obstacle in the way of increased expenditure on military aviation. The Secretary of State for War is therefore directly responsible for the economical restriction of expenditure on aviation. There is an economy which is too dearly purchased, and the treatment of the Air Corps is a case in point. If in a future war we suffer defeat owing to the unpreparedness of our defences, it will be poor consolation to reflect that in 1912 the War Office pleased the House of Commons by saving money at the expense of efficiency.

Practice on Paper.

No preparations are apparent for attaching aviation squadrons to different commands that general officers commanding may gain experience in the employment of aeroplanes. As is common in the history of the British Army, paper schemes form a large proportion of its organisation, and practice under war conditions is either impossible or—if possible—looked on with disapproval by the deities of Whitehall. The order of the French Minister of War that general officers commanding divisions should familiarise themselves with the practice of aviation might be copied with advantage in this country.

In reply to a question, Colonel Seely said that it is intended to train non-commissioned officers and privates to fly, in addition to the officer pilots. Nothing could be better, as it will prevent wastage of officers in piloting multi-seater machines.

The entire statement, and the answers to questions consequent on the statement, lack definition. Most of the details furnished are capable of alteration in the course of an antagonistic debate owing to the ambiguity of grammatical construction. It is, of course, good Parliamentary practice and as far from honesty as is usual.

The Debate on the Air Corps.

In the course of the debate on the Army Estimates in the House of Commons on March 6th, Mr. Arthur Lee, referring to aviation, said:—We on this side, and I am sure hon. gentlemen in every quarter of the House, must welcome the substantial, though lamentably tardy, action which the Government have taken with regard to this matter. The Government blindness and indifference in the past with regard to military aviation, with regard to this new arm which may quite conceivably revolutionise modern warfare, have gone so far as to become a national peril, and but for the action which has been taken by the Government in the present Estimates there would undoubtedly have been a concentrated and determined attack by all who are interested in this question. Particularly so is that the case when we realise what the situation would have been last summer if our Expeditionary Force had had to go to war. It would have been the only one of the armies which would have been likely to have been engaged which would have been without eyes. I say deliberately without eyes in the modern sense. They would have been able to send practically no flying men with that army for the purpose of gaining information, and that would have subjected our army to a handicap which might have been fatal. I know the right hon. gentleman himself is not to blame in this matter, and we have been particularly lenient towards him about it. I know he has done his best, at least since he was inoculated at Hendon, and that without his help and pressure we should never have got the scheme which we have got to-day. To that extent we thank him sincerely. I wish to say one or two words with regard to the scheme itself. In the first place, I should like to recognise the broad national framework which has been adopted. Apparently the intention is to institute a service which is not to be a mere appenage of the Royal Engineers. And fortunately it does away with the Air Battalion, which really has become a farce, and which I am very glad to hear has been taken off. Then I am sure that it is perfectly sound that in this matter there should be a National Flying Corps with the army and navy to co-operate rather than make it a purely War Office concern. On this occasion we are not permitted to discuss anything but the army side of it, but as far as that is concerned, the Government, I am sure, is proceeding on right lines; that is to say, that before anything else they are trying to get a sufficient strength and reserve of flying men. That is the point which the Parliamentary Aerial Defence Committee ventured to urge, namely, that whilst you are waiting for the best aeroplanes and the best instruments, at any rate get men who are able to fly. I am glad to see that that scheme has been put first. There has been no excuse for the delay which has taken place with regard to this most important matter.

I come to the Central Flying School and its accessories. All that seems to be admirable as far as one can judge from the right hon. gentleman's statement. I would like to know why it is that £90,000 has got to be spent on land for this school in view of the very large holdings which the War Office already possess on Salisbury Plain. The sum told off for aviation seems to be large, but out of it £90,000 goes for land and £38,000 for building, and I do not know how much more for the school and various accessories. The result is that very little is left for the provision of actual flying men

The late Mr. D. G. Gilmour flying at Henley last summer.

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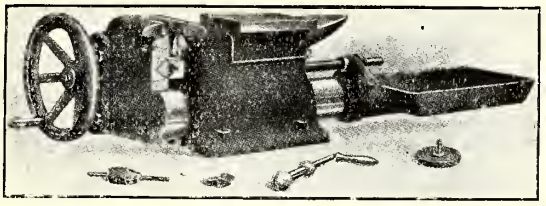

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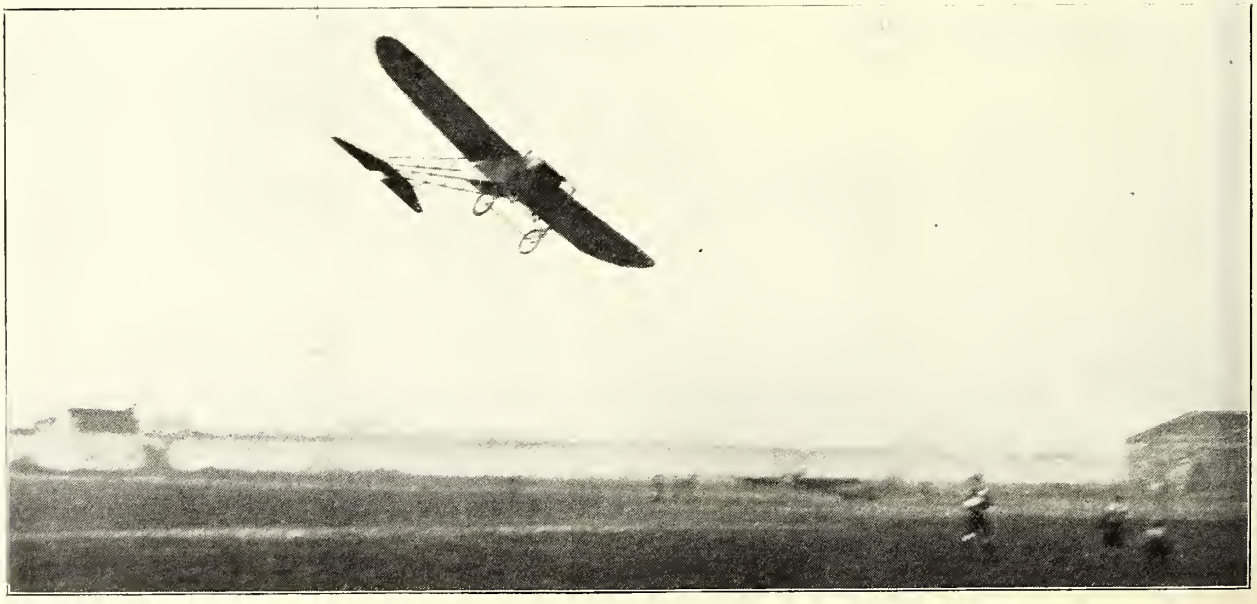
and flying machines, which are essential. When we compare the provision which has been made with that of Germany or France—France is voting over a million pounds, of which £300,000 is devoted to the purchase of aeroplanes alone—our vote does look unsubstantial. But, at any rate, I may be permitted, on behalf of the Parliamentary Aerial Defence Committee, heartily to approve of the Government's action in undertaking the immediate purchase of a considerable number of aeroplanes of any make, British or foreign, that happen to be efficient. After all, what is wanted is to give our army the necessary eyes at the earliest possible moment, and particularly to give those eyes to our Expeditionary Force. In that way the Government are proceeding on sound lines. They have evolved a scheme by which the Expeditionary Force is to be equipped as soon as possible with a complete aeroplane corps or a series of aeroplane squadrons. I am sure that that is right, and I hope that they will spare no effort to complete that equipment at the earliest possible moment. But do not let them forget that the army will need eyes in this country also. The closer the country the more need of them. We need sufficient equipment for home defence also. I hope that that will not be forgotten.

It is also satisfactory that the Government are doing something to encourage private enterprise in this matter. After all, the pioneers who have risked their lives and their money in bringing this business to the practical point where the Government can take it up have deserved well of the country. I think the Government is doing a good deal to encourage them. I would ask, however, that the Government should not limit the number of the officers who may be permitted to get the Aero Club certificate at any of these flying schools and to receive the £75 indemnity from the Government as the result. At this stage you cannot have too many flying men. It is not sufficient merely to fill up the ranks of your flying corps. When you consider home defence and the necessities of the army abroad, it is of the utmost importance that you should get every man able to fly that you can. The wastage in case of war would be enormous. Therefore I hope the Government will place no restrictions on the amount expended in that way. I hope also, that although the right hon. gentleman has not been able to make a statement in regard to it at present, adequate remuneration will be given to the officers and men who take part in this service. We always have our difficulties in getting money out of the Treasury, whatever Government is in power, but I hope the right hon. gentleman will press this point. These men who take part in this extremely perilous service deserve just as well of their country as those who take part in another service which is occasionally perilous—I mean the submarine service in the navy. They ought to be treated at least as well, and I hope we shall have an assurance on that point. Finally, I trust that the independence of this new Flying Corps will be secured; that it will be taken out of the hands of any vested interest in the War Office; that it will have some representative of the War Office who is a whole-time chief, and that it will be taken out of the hands of any overworked officer, such as the Master-General of Ordnance, who really has not time to attend to a matter of this importance. I hope the commandant of the new school will be an officer of sufficiently high rank and prestige to command the attention of the military public. What is wanted at this stage is not only prestige, but daring enterprise, initiative, and, particularly, no tethering of the aeroplane or the Flying Corps to the apron-strings of the War Office. I venture very respectfully to congratulate the right hon. gentleman upon his personal efforts as chairman of the Committee which produced this scheme, to beg him not to rest on his oars in regard to this great matter, and to assure him that if he requires or is willing to accept any assistance from this side of the House in regard to the establishment of this picked and essential army service he will receive it in no small measure.

Colonel Seely: With regard to the flying ground, the question is asked, Why are we spending £90,000 on buying it, and the answer is that it was the best flying ground we could find. It is about 4,000 acres in extent, and a very fine ground. I may say that we did badly want an extension of ground in the neighbourhood of Salisbury Plain. I think everybody knows that that is so, and although this flying ground is primarily for aviation, and nothing must be done by other troops to check this new science, part of it may be useful, provided it does not interfere with its use for aviation. In addition, it sets free the area which was hitherto rather unsatisfactorily used by those flying on Salisbury Plain. I was asked about the pay. I am not yet in a position to name the precise sum except to say this as an indication: that it is settled that the commandant, who will be the senior officer of the flying corps, shall have the emoluments, and, on the question of rank, shall have the general status of such officers as the Chief of the Staff College, the Chief of the Royal Military Academy, and the Chief of the Royal Military College. That, I think, will give an indication of the spirit in which we wish to approach this important question. I trust I have dealt with most of the points raised.

The Safety of Flying.

M. Besançon, of the Aero Club de France, at the annual meeting of the club on March 9th, mentioned that though last year there was one death every 6,000 kilometres, this year according to him only one death has occurred to every 100,000 kilometres flown (62,000 miles). During 1911, 12,000 passengers were carried against 4,800 in the previous year. Cross-country flights in 1911 amounted to 13,000, whereas in 1910 they were only 3,000. In 1910, 500,000 kilometres were flown in 8,300 hours; in 1911, 2,600,000 kilometres in 30,000 hours.



Mr. Gustav Hamel doing an astonishing turn on Mr. Sopwith's Bleriot on Sunday last.

The Royal Aero Club Election.

By the time this appears voting papers for the new Committee should be in the hands of the members of the Royal Aero Club, and practically the fate of British aviation for the coming year will also be in their hands. It is, therefore, to be hoped that a wise choice will be made in the selection of the new members of the Committee.

It will be noted in the Royal Aero Club notice that every one of the nine retiring members of the Committee have been put up for re-election, apparently as a protest against any attempt at reformation of the Club, and in the hopes of splitting the votes for the new and desirable candidates. It therefore becomes an unpleasant necessity, but none the less a duty, to point out definitely why certain members should not be elected to the Committee, as well as the more congenial task of pointing out why certain members should be elected.

The Desirable Nine.

The nine names which seem to find most favour among those who wish the Club well are as follows:—

Mr. G. B. Cockburn, as a thoroughly practical flier and a man of unusual ability and judgment, a hard worker, and a regular attendant at committee meetings.

Mr. Harry DelaCombe, as one who has had the greatest experience of aviation from its commencement, a very able constructive critic, and an excellent organiser.

Capt. J. D. B. Fulton, as representing the Army, as a practical flier, and as a very able administrator.

Major Lindsay Lloyd, as representing aerodrome proprietors in general, and because of his experience in organising all forms of sport.

Mr. Fred May, as representing the interests of British engine manufacturers, as a thorough good sportsman, and as a man of great experience of committee work.

Sir Charles D. Rose, Bart., M.P., a most able administrator, a man of great influence, and the one who of all the members of the Club would be the most worthy holder of the office of chairman.

Mr. Norman Clark Neill, as a sportsman of the right type, who has always shown a keen interest in aviation, who is a splendid worker whenever his services are required, and as one of very considerable social influence.

The Marquess of Tullibardine, M.P., as representing both the Army and the House of Commons; also a man of influence in the right quarters, and one who would, in the absence of Sir Charles Rose, or if he should for any personal reason refuse to occupy the chair, make an excellent chairman for the Club. Lord Tullibardine, though the most recent nomination for the Committee, should undoubtedly be elected at all costs, for he has shown himself in the House of Commons actively interested in aviation, and he would be in every way exactly the type of man who is required for the Committee, if it is to have the dignity and carry the influence desirable in a royal club.

Lastly, Commander C. R. Samson, R.N., as representing the Navy, a clever aviator, a capable officer, and in every way a man of the right stamp.

The Remaining Eleven.

There remain, then, eleven candidates who cannot be elected if these nine should be elected, and it is only fair to deal with them on their merits.

To begin with, Mr. H. Barber and Mr. A. V. Roe would make excellent and hard-working committeemen, but it must be recollected that aeroplane builders are already represented on the Committee by Captain Dickson, and that, further, the engine section of the trade will be represented by Mr. Fred May if he should be elected, so that the trade will have adequate representatives.

Lieut. B. H. Barrington Kennett, who is altogether an excellent candidate, must, it is feared, stand down if Captain Fulton is to be elected.

Mr. Bucknall, thorough and hard-working committeeman as he is, can only be asked to make way for the much-needed new blood on the Committee, though it is hoped that he will be induced to stand again next year, when an even more sweeping alteration will have to be made in the other half of the Committee.

Colonel Capper, though in many ways a good practical man, is not, it is feared, so closely in touch with modern movements as is desirable in this critical period of the development of aviation.

Mr. C. C. Grunhold, also an excellent worker for the Club, and a new candidate for the Committee, is in much the same situation. He would be another excellent member if there were room for him.

Mr. Ernest Manville, in spite of his donations in the way of prizes, has, unfortunately, not attended a single Committee meeting during the past year, and one can, therefore, hardly regard him as a serious candidate for a place on the Committee.

The Hon. Arthur Stanley, M.P., cannot be considered eligible for the same reason, for he also has not attended a single meeting, and, worse still, has not even taken part in debates on aviation in the House of Commons. It is only surprising that he should have consented to be nominated again.

Mr. J. T. C. Moore-Brabazon, though he has attended some fifty per cent. of the Committee meetings, is also not so fully in touch with latter-day developments as desirable in a committeeman.

Mr. Mortimer Singer, also one of the leading donors of prizes for aviation, appears also to be somewhat out of touch with the men who are actually doing the work.

The last name on the list as it stands is that of Mr. Roger Wallace, K.C. Reference has already been made to the amount of work Mr. Wallace has done for the Club, and he has certainly done his best according to his lights; but undoubtedly the chairmanship of such a club as the Royal Aero Club should not be a life appointment, and, without going into details, it should suffice to say that a new chairman is needed, because a new chairman is needed. Taken purely on his merits as a committeeman, Mr. Wallace, though a very regular attendant at committees, is in much the same situation as various others of the retiring members, in that he might undoubtedly be more closely in touch with both service and civilian aviators, and with the constructors of aeroplanes, and though one could undoubtedly strongly advocate his election to the Committee if the Committee were larger, it is, unfortunately, a fact that if the nine best men are elected there is no room for a tenth.

The Responsibility of the Members.

It is to be hoped that every member of the Club will consider the marking of his ballot-paper as a very serious part of his duty to the cause of aviation, and that before striking out the name of any one person on the list he will consider very carefully the value of that particular person to the advancement of aviation.

This year is a most critical one for everybody concerned with flying, and more than that, it is actually critical for the British Empire, because on an adequate system of aerial defence depends the safety of the country.

Small though the Royal Aero Club may be in numbers, it carries great influence with those responsible for our national defences, and undoubtedly if the Committee of the Royal Aero Club during the past year had been composed of men who were thoroughly in touch with aviation, and with the constructors of aeroplanes, we should, ere now, have been very much closer to having an adequate air corps, thoroughly equipped with British-built aeroplanes, than we are likely to be for another twelve months.

We may blame the War Office and Admiralty for their supineness, but the Committee of the Royal Aero Club is very largely responsible for that attitude, for influence which might have been used has not been used, and agitation which might have been backed up has not been efficiently backed up, with the result that we find ourselves as we are now, not only inadequately equipped, but with an inadequate programme. It is now in the hands of new members of the Royal Aero Club to see that this position is remedied in the near future.—C. G. G.

The Royal Aero Club.

The annual general meeting of the members of the Royal Aero Club of the United Kingdom will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

The following have been nominated for election to the committee:—H. Barber, Lieut. B. H. Barrington-Kennett, *Ernest C. Bucknall, *Col. J. E. Capper, C.B., R.E., *G. B. Cockburn, Harry DelaCombe, Capt. J. D. B. Fulton, R.F.A., C. G. Grunhold, Major F. Lindsay Lloyd, *E. Manville, Fred May, *J. T. C. Moore-Brabazon, Norman Clark Neill, A. V. Roe, *Sir Charles D. Rose, Bart., M.P., Commander C. R. Samson, R.N., *A. Mortimer Singer, *Hon. A. Stanley, M.P., The Marquess of Tullibardine, M.V.O., D.S.O., M.P., *R. W. Wallace, K.C.

* The names marked with an asterisk are those of members of the present committee.

Members are reminded that a ballot paper for the election of nine candidates to seats on the committee of the club will be forwarded to them at least seven days before the date of the annual general meeting.

The following new members have been elected:—Frank Martin Ballard, A. J. A. Wallace Barr, Lieut. John Graham Bower, R.N., Louis Carle, L. A. Legros, Cecil Howard Pixton, John Sainsbury, and Alfred Wilson-Hughes.

The following aviators' certificates have been granted:—(189) Herbert Dennis Cutler (Short biplane, Eastchurch); (190) Victor Barrington-Kennett (Short biplane, Eastchurch); (191) Lieut. Clement Gordon Wakefield Head, R.N. (Bristol biplane, Salisbury); (192) Lieut. Charles Longcroft (Bristol biplane, Brooklands); (193) Cyril Wright Meredith (Short biplane, Eastchurch).

The Institution of Automobile Engineers will hold a meeting on Wednesday, March 13th, 1912, at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W., when a paper by Mr. G. de Havilland, of the Air Corps Factory, Farnborough, entitled "Aeroplane Undercarriages," will be discussed. The Institution of Automobile Engineers has kindly placed a limited number of tickets at the disposal of the Royal Aero Club, and members wishing to attend are requested to make application for tickets to Harold E. Perrin, Secretary, R.Ae.C.

THE AERONAUTICAL SOCIETY.

OFFICIAL NOTICES.

(1) Annual General Meeting.—The Annual General Meeting will be held on Wednesday, March 27th, 1912, at 8.30 p.m., at the Royal United Service Institution, Whitehall, S.W.

(2) Council.—In accordance with the rules the Council shall consist of sixteen voters, of which one-half shall be Fellows or Associate Fellows and one-half shall be members. Members of the Council are elected to serve for two years, and half retire annually. Retiring members are eligible for re-election if re-nominated.

The retiring members of the Council are:—*Associate Fellows:* Capt. A. D. Carden, R.E., T. W. K. Clarke, J. W. Dunne, J. H. Ledeboer. *Members:* John Dunville, F. K. McClean, Lord Montagu of Beaulieu, Colonel F. G. Stone, R.A. The following have been nominated for election:—

Associate Fellows: H. Barber, Capt. A. D. Carden, R.E., T. W. K. Clarke, J. W. Dunne, R. L. Howard Flanders, J. H. Ledeboer, Archibald R. Low, W. O. Manning.

Members: Major B. Baden-Powell; Capt. P. W. L. Broke-Smith, R.E.; Capt. C. J. Burke; Col. J. E. Capper, C.B., R.E.; Lieut. R. Gregory, R.N.; Lieut. G. B. Hynes, R.G.A.; Lieut. A. Longmore, R.N.; F. K. McClean; Lord Montagu of Beaulieu; G. F. Mort; Major-Gen. R. M. Ruck; Lieut.-Col. C. O. Smeaton, R.A.; Col. F. G. Stone, R.A.; Capt. F. H. Sykes; Chas. C. Turner; Capt. H. F. Wood.

(3) Council Meeting.—A meeting of the Council was held on Wednesday, March 6th, 1912, when there were present: Mr. A. E. Berriman (in the chair), Mr. Griffith Brewer, Mr. T. W. K. Clarke, Mr. B. G. Cooper, Mr. Alec. Ogilvie, Mr. F. Handley Page, and Mr. B. Woodward (hon. solicitor).

(4) Assistant Secretary.—Mr. Harry Turrill has been appointed Assistant Secretary of the Society from March 1, 1912.

(5) Meetings.—Weekly meetings of an informal nature will be held at the Society's Offices, 11, Adam Street, Adelphi, on Mondays from 5 p.m. Refreshments can be obtained and the library and current periodicals will be available for reference as usual.

The first meeting will be held on Monday, March 18th.

(6) Pilcher Memorial Fund.—This fund is to enable a Memorial Column to be erected at Stanford Park, the seat of Lord Braye, on the spot where the late Percy S. Pilcher met his death on September 30th, 1899. The famous pioneer was an active member of the Society, and at the time of his death a member of the Council. The Council beg to acknowledge the following subscriptions: Amount previously acknowledged, £14 13s.; Mrs. Tidswell, £2; G. Brewer, Esq., £1 1s.; Alec Ogilvie, Esq., £1 1s.; A. E. Berriman, Esq., 5s.; Chas. C. Turner, Esq., 5s.—T. O'B. Hubbard, Secretary.

French Military Aviation.

The municipality of the city of Troyes has the intention of applying to the Minister of War that he may instal a military aerodrome on the outskirts of the city. The municipality will undertake the expense connected with the formation of the aerodrome and the construction of the hangars.

The Grand Manœuvres of the French Army will take place this year to the south of the Loire. Over 120 aeroplanes and troops to the number of 140,000, about a fifth part of the effective French Army, will take part. The 9th Army Corps (Tours), the 10th (Rennes), the 11th (Nantes), and parts of the 4th (Le Mans), and the 5th (Orleans), and the 3rd Division of Colonial Infantry will all be employed.

The Minister of War has now issued the decree dealing with the reorganisation of the Army Air Corps. Amongst the thirteen articles of this "projet de loi" it is ordained that the corps shall be under the command of a general officer bearing the title of Inspector-General of Aeronautics. It is to be recruited from all arms of the service. The troops concerned will form an aeronautical regiment containing a regimental general staff (état-major) and eight companies.

The widows and orphans of those killed in the course of their aerial duties will receive compensation and pensions. Officers and men injured in the course of their service will also receive similar compensation to that granted in time of war to wounded soldiers.

Twenty crosses of Chevalier of the Legion of Honour and ten military medals are to be placed at the disposal of the Ministry of War annually for aviation decorations only.

A military aviation camp was opened on March 10th at Caussade (Tarn-et-Garonne). Attached to it are Lieutenants de Malherbe, Massol, de Montjou, and de Bernis.

The military aviation camp at Biskra, in Algeria, which was referred to briefly last week, is now in a state of readiness for service. Lieutenant Laffargue is in command of the centre, and with him are Lieutenants Reimbert and Joly. The four Farman biplanes attached to the centre are housed in three Bessoneau hangars erected at Sidi-Ghazel, four kilometres from Biskra, and close to the Biskra-Touggourt railway. The landing-ground is over three kilometres in extent.

The duties of the officer aviators are to report on the meteorological conditions of Algeria, and to make extended aerial reconnaissances of the surrounding country.

In the neighbourhood of Saint-Cyr recently Lieutenants Varoin and Marzac, one of them accompanied by Lieutenant Girault as observer, made long flights on biplanes over the 11th Regiment of Artillery while at gun practice. The aviators took photographs of the batteries and of the effect of gunfire, and made copious notes dealing with the ranges and the general appearance of artillery practice from above. The information gained by this practice will of great value for instructional purposes.—W. E. de B. W.

French Naval Aviation.

The Minister of Marine (M. Delcassé) has issued a provisional order regulating the increases of pay due to naval aviators. "Enseignes" are to receive 10 francs additional daily pay, "lieutenants de vaisseau" 11 francs, and officers of higher rank 14 francs. To be considered as qualified for this increase officers must be (1) pupils, (2) holders of the superior military brevêt and in charge of an aeroplane, (3) acting as observers, and in this case during the actual flights only.—W. E. de B. W.

Belgian Military Aviation.

Belgium possesses at the moment three army aeroplanes and fourteen military aviators. The Minister of War has circularised the officers commanding regiments, asking them to send the names of those desiring to become military aviators. On March 1st a party of officers began a course of aeronautics at the Braschaet Flying School, under the tutelage of Lieutenants Nélis, Lebon, and Danis.

In the Belgian Army Estimates a sum of 250,000 francs has been set apart for the expenses of the military aviation camp at Braschaet. Several new machines are to be purchased from Belgian constructors. The old machines have been overhauled and re-covered with fabric.—W. E. de B. W.

Austrian Military Aviation.

The Austrian Army had, last month, twenty aeroplanes in its service. In the course of the next few days five monoplanes and five biplanes are to be delivered to the Air Corps. Preparations are being made for the use of aeroplanes in the autumn manœuvres. It is thought possible that the War Department, following the practice of France and England, may hold a military aeroplane competition for the determination of the type most suitable for service in the Austrian Army.—W. E. de B. W.

United States Military Aviation.

The requirements of any aeroplane purchased for use in the U.S.A. Army are as follows:—

(1) It must carry two persons, with the seats so arranged as to permit of the largest possible field of observation for both; (2) the control must be capable of use by either operator

from either seat; (3) the machine must be able to ascend at a minimum rate of 2,000 ft. in 10 minutes while carrying a weight of 450 lb., and the amount of fuel stated in paragraph 4; (4) the fuel supply must be sufficient for at least four hours of continuous flight; (5) it must be easily transportable by road, rail, etc., and easily and rapidly assembled and adjusted; (6) the starting and landing devices must be part of the machine itself, and it must be able to start without outside assistance; (7) the engine must be capable of throttling to run at reduced speed; (8) the engine will be subject to an endurance test in the air of two hours' continuous flight; (9) the aeroplane must develop a speed in the air of at least 45 miles an hour; (10) the machine must be capable of landing and arising from "plowed" fields; (11) the supporting surfaces must be of sufficient area to ensure a safe gliding angle in case the engine stops. This will be determined by a test during calm atmospheric conditions, at an altitude of 1,000 ft. the engine will be entirely cut-off and a glide made to the ground. The horizontal distance between position of cut-off and landing must be at least 6,000 ft., or at other altitudes of the same ratio. Note.—In case the weight-carrying capacity is increased to 600 lb., the minimum speed may be reduced to thirty-eight miles per hour and the climbing power diminished to 1,600 ft. in 10 minutes.

The War Department has ordered five aeroplanes for the Army, as follows: 3 Wright biplanes, standard type, minimum speed 45 m.p.h.; one Wright racing type, minimum speed 65 m.p.h.; and one Burgess-Wright aeroplane, 70-h.p. Renault engine, weight carrier, speed 45 m.p.h.—W. E. de B. W.

United States Naval Aviation.

The U.S.A. Naval Air Corps is at present stationed at San Diego, California, where Ensign Victor Herbster is learning to fly a Wright biplane owned by the Navy. Strange though it may seem, there is a lack of suitable naval officers volunteering for aviation service, and special inducements have to be offered.—W. E. de B. W.

LONDON-PARIS AND BACK.

The Blériot machine scored another triumph last week, when M. Henri Salmet first of all beat all records for the journey from London to Paris, and then set up a new record by flying back during the next two days.

On the 7th M. Salmet left Hendon just before 8 a.m., and, flying over Ealing and Wimbledon, reached the coast at Eastbourne. Thence he took the direct route to Dieppe, and so to Paris, landing at Issy-les-Moulineaux in 3 hrs. 12 mins. from the start.

He was somewhat favoured by a north-west wind, as may be seen from his time, which works out at nearly 80 m.p.h., his machine, which was of the ordinary Blériot 50 h.p. cross-country type, and by no means a new one, having a speed of about 65 m.p.h.

In taking the direct route from Eastbourne to Dieppe, M. Salmet covered some 64 miles of sea, and consequently was taking a considerable risk, but to minimise this he had the bodywork of the machine carefully made water-tight, so that it would act more or less as a boat if he came down in the water, and he had equipped himself with inflated tyre-tube to act as a lifebuoy.

After a rest in Paris, M. Salmet started back at 2.16 p.m., with the intention of reaching London the same evening, but during the middle of the day the wind had risen considerably, and consequently M. Salmet's progress was considerably slower, with the result that he finally landed about 5 p.m. at Berck-Plage, near Boulogne. The following day M. Salmet started again, but was forced by the wind to come down at Chatham, where he damaged a propeller and fitted a new one. Starting again the following morning, he ran into a fog at Maidstone and came down there, and, when the fog cleared, continued northward, crossing the Thames and getting as far as East Ham. Here his Gnôme failed him, and he had to land as best he could in a small field at Beckton.

Just as he was on the point of flattening out for landing, he was caught by a gust on the left, which turned the machine over so that he came down on the right wing and the side of the chassis and promptly turned over. M. Salmet fortunately escaped with nothing worse than a severe shaking and much rolling in the mud. The machine, which was his own property, was very severely knocked about, and Mr. Peggs, The Aeroplane correspondent in the district, says that the whole chassis, the right wing, and the fuselage longitudinals were all broken as well as the propeller.

M. Salmet was born on July 22nd, 1878, so that he is approaching 34 years of age, and, therefore, his feat is not that of a youth seeking notoriety, but of a clever flier of mature age setting out with the intention of doing a really big flight. By profession M. Salmet was a commercial traveller prior to taking up aviation, but he has proved himself to be not only a very fine flier, but an exceeding clever mechanic on engine work. He took his pilot's certificate on June 17th, 1911, and has since been chief pilot of the Blériot School at Hendon.

M. Henri Salmet, the hero of the Paris and back flight on the Bleriot.

He is full of energy, and in many ways recalls Védrines, both in his physique and method of flying, so that with luck he ought before very long to distinguish himself as one of the foremost aviators of the age. His ambition is to leave London after breakfast, lunch in Paris, and get back to London in time for dinner. Given a moderately calm day, there is little doubt he will succeed, especially if he has one of the newest cross-country 70-m.p.h. Blériots for the purpose.

Mr. Hamel's Disappointment.

Mr. Gustav Hamel certainly had uncommonly hard luck on Thursday last. It was his intention to start that morning at the same time as M. Salmet for his trip to Paris on his Blériot two-seater with Miss Trehawke Davies as passenger. Everything was got ready for the start, but at the last moment, in filling the petrol tanks full for the long journey, it was discovered that there was a slight leak in the pipe from one tank to the carburetter, so, of course, the journey had to be postponed, and during the rest of the week the weather was too bad to permit the trip. However, just by way of showing that he was not out of practice, Mr. Hamel came down to Brooklands on the Sunday afternoon and proceeded to do some wonderful exhibition flying on Mr. Sopwith's tandem Blériot.

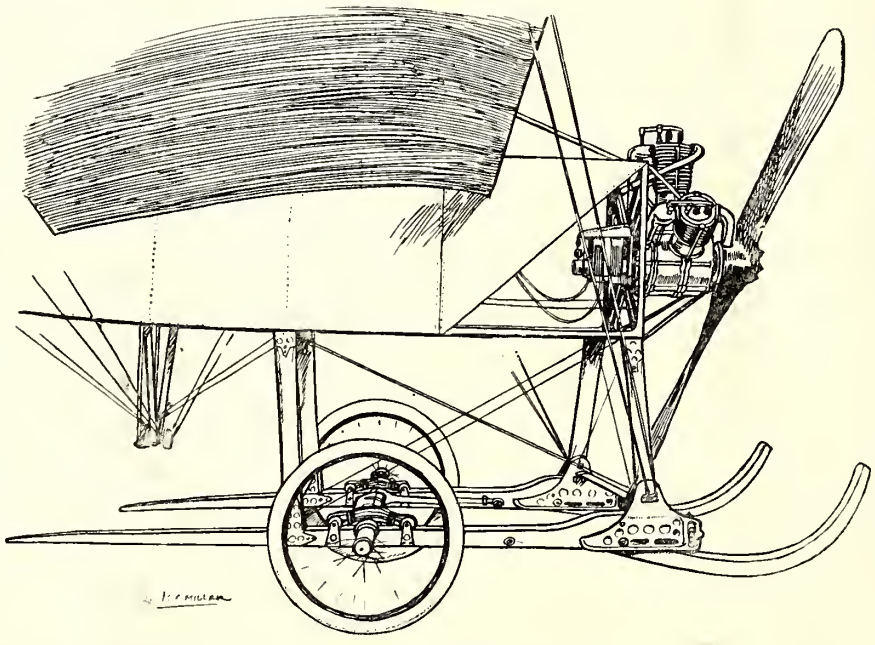
Lieut. Longmore and the Mortimer Singer Prize.

On Monday last Lieut. Longmore, R.N., flying for the Mortimer Singer Prize, flew for four hours on the Short tractor biplane, covering 196 miles. He descended owing to the Gnôme running weak, otherwise he had plenty of fuel for a further 2½ hours. This fine flight puts him at the head of the Navy for their share of the prize, and with a more reliable engine he would certainly have beaten Lieut. Barrington-Kennett's Army distance.

The Bristol Single-Seater.

One of the prettiest monoplanes at present in existence is the little single-seater Bristol now at Brooklands. This machine has many of the characteristics of the big two-seater, but is fitted with a 28-32-h.p. Anzani engine, which seems to give it ample power.

Incidentally the smaller stationary engine does away with any possible effects of the gyroscopic force of the big rotary Gnôme on the two-seater, so that the machine is exceedingly quick in handling, and it is not likely to be affected by the gyroscopic force of the comparatively small fly wheels in the Anzani



In its general outlines it is exactly like the two-seater, having the small balanced rudder perched on the top of the fuselage, and the balanced elevator pivoted on the central line of the fuselage.

The pilot in this machine is placed very far forward where he is able to see down almost over the front of the wings, and where his weight and the weight of the engine are about as close together as it is possible to get them, so that the moment of inertia of the two chief masses in the machine is as small as possible.

Just behind the engine the front of the fuselage slopes away so that most of the oil sprayed out through the auxiliary exhausts is carried down under the machine, and the pilot is further protected by a little wind-cutter dash just in front of him.

The control is in the usual manner by means of a double-handle lever for the elevator and warp, and a foot-bar for the rudder.

The chassis follows the general lines of that of the two-seater, containing two pairs of upright struts and two main skids, with spring tusks in front of them, in case of the machine landing too much on its nose. These tusks have on many occasions proved most effective, and have righted the machine, when in the form of rigid skids they would either have broken or turned the machine clean over. The rear end of the main skids is prolonged for a considerable distance backwards, so that when the machine is standing it rests on these heels, instead of carrying the weight on a tail skid, and so straining the fuselage whenever it is moved.

The whole of the chassis is immensely rigid, as has been proved on many occasions when pupils in their novitiate have landed on the points of the skids, and have even broken off the spring tusks without damaging the rest of the chassis. In the case of Capt. Allen's landing in the Sewage Farm at Brooklands recently, the chassis practically buried itself in the soft ground, and was pulled out almost undamaged.

As in all Bristol machine, the workmanship and material are beautiful. The fabric on the machine is treated with a special "dope" of the Bristol Company's own, which gives an extremely rigid surface, and seems impervious to damp. Altogether the machine is one of the nicest of the light monoplanes which are now becoming popular, and are undoubtedly the precursors of the privately owned sporting machine of the future.

The Latest Blériot Types.

Mr. Norbert Chereau, the chief of the Blériot firm in England, is even more than usually enthusiastic about the latest type of Blériot machines for 1912. It will be remembered that those shown in Paris at Christmas time were in many respects a distinct improvement on current practice, but Mr. Chereau avers that the patterns produced since then, though very similar in general aspect, are a decided advance. The little "Type Populaire" remains the same, but it has been reduced considerably in price, so that it now comes within the reach of the average sportsman. It is, however, in the military machines that the most remarkable alterations have been made, chiefly with a view to rapid assembling and quick packing.

The whole machine can now be brought out of its case and assembled ready for flying in a quarter of an hour by two men. The wing stays are fixed in such a way that they can be detached without the use of spanners, and yet when in place they are locked immovably by their own tension. The wings themselves are also fixed so that no tools are needed to fix or unfix them. The fuselage is jointed in front of the tail, so that it folds over the top of the machine; the tail itself swings round, so as to lie lengthways of the machine; the wheel suspenders are made so that they can be detached and let the wheels up to a level with the lower *planche*.

Consequently the whole machine will go into a case only as deep as from the top of the little low cabane to the bottom of the *planche*, and as long as one wing, so that the whole thing is easily packed on an ordinary motor lorry. This arrangement applies both to the single-seater and double-seater, and should commend the machine to all interested in military work. It is certain that before very long the Blériot Company will have their own works open in this country, and the advent of the first British-built Blériots will be awaited with interest.

The Coventry Ordnance Biplane.

Probably the first machine which is likely to be ready for the military competition is the new Howard Wright biplane, which Mr. Howard Wright, now amalgamated with the Coventry Ordnance Works, has nearly completed. The writer recently had the privilege of inspecting the parts of the machine in course of construction, and has been shown some of Mr. Manning's exceedingly clever designs for the machine; consequently he is able to state definitely that when the machine appears it will at once refute the statements made by those who ought to know better, that British constructors are in any way behind those abroad.

It will not be giving away any secrets to state that the machine is a biplane with 100 h.p. engine placed in front, driving a very large geared tractor screw. The chassis design is one of the cleverest, and at the same time simplest, yet seen, and the whole machine is remarkable for its enormous strength. At the same time, it will not be unduly heavy, and it will be exceedingly easily taken to pieces and reassembled. All aluminium lugs and sockets have disappeared from the machine, and steel pressings or steel angle-lugs have taken

their place, so that the machine is both lighter, stronger and more reliable. It should be in the air by about the end of this month, and will be piloted by Mr. Sopwith.

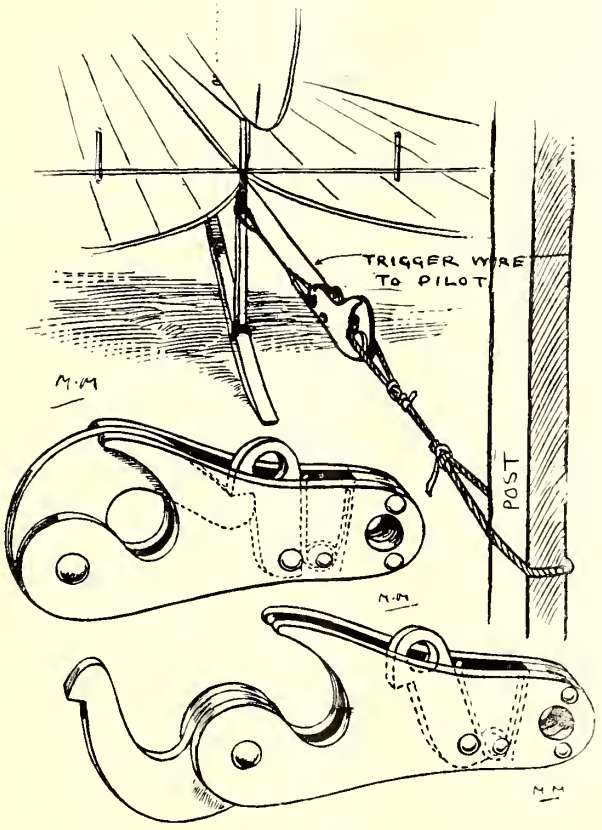
The Utility of Release Gears.

Not long ago reference was made in The Aeroplane to the condition in the War Office competition which decrees that the aeroplane shall be started without the pilot requiring outside assistance, and it was then pointed out that some form of release gear would practically be a necessity in the competition, and that, besides this particular occasion, release gears were preferable on all machines to the clumsy method of having a crowd of assistants hanging on to the tail.

As a matter of fact, the hanging-on business is actually dangerous, because with inexperienced assistance it is quite possible for one of the hangers-on to damage a tail stay or rudder lever at the moment of letting go, so that when the machine gets into the air the damaged part collapses.

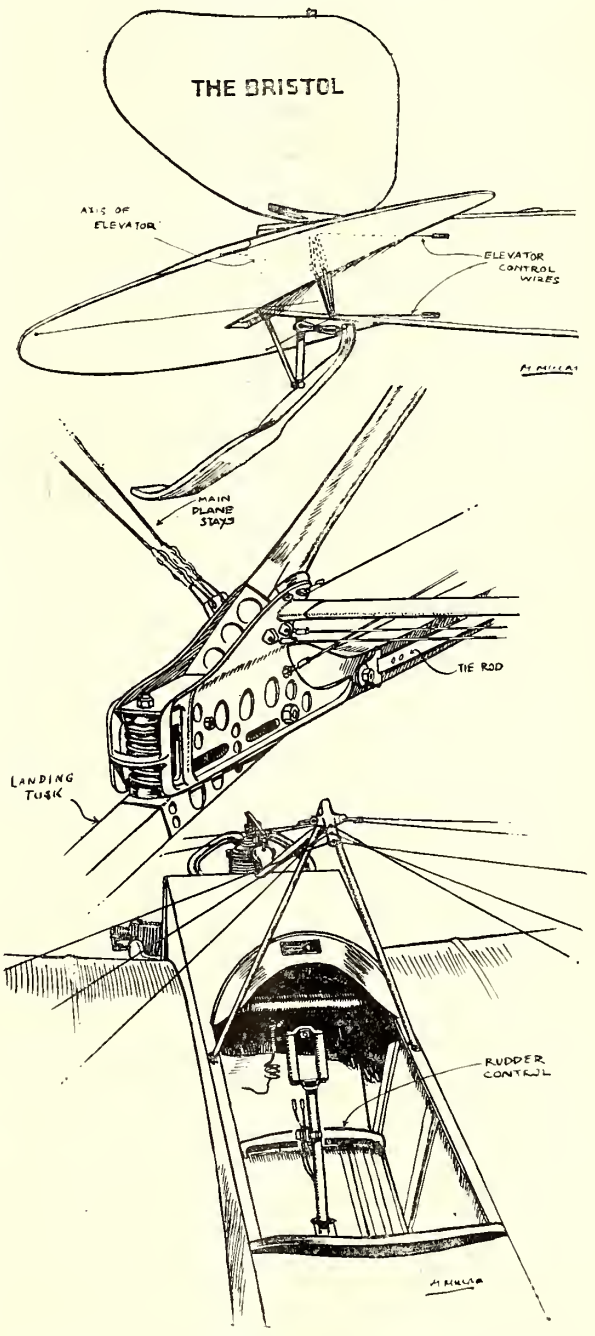
Considerable damage was done to Mr. Pixton's Avro on the occasion of his flight to Brighton, when he descended at Plumpton and commandeered the assistance of sundry rustics to hold the machine at his departure. They put their weight into it with such good effect that the tail skid and part of the rudder post were materially damaged. Fortunately the damage was so severe that Mr. Pixton heard the breaking of the woodwork, and so did not get off, otherwise a very nasty accident might have happened.

Probably the first release gear to be used was patented by the late Mr. D. G. Gilmour, and he used it with great success on many occasions. Mr. James Melly, of the Liverpool Aviation School, also has a very effective release gear of his own invention, and another which is very efficient and simple is that made by Messrs. Rubery, Owen, and Co., which is illustrated herewith.



In this release the small end of the catch is fixed to the machine in any suitable manner, and a wire passes from the trigger on the top to the pilot's seat, this portion remaining a fixture on the machine. When it is desired to use the gear a piece of wire is passed round a tree trunk, a stake, a peg in the ground, a fence post, or any other suitable fixture, and this is caught in the movable hook of the gear, which is afterwards snapped into place and held down by the trigger. The pilot can then start his engine, get into his seat, run his engine at full speed till he is satisfied it is going properly, and, on releasing the trigger, the pull of the fixed wire on the catch pulls up the hook of the gear, and the machine is released at once, leaving only a couple of feet of wire behind.

The arrangement is very simple, very cheap, and the cost of very little damage by an inexperienced assistant to the tail of a machine would pay for a considerable number of these release gears, besides which, of course, the system of slipping by means of a release gear is a sound mechanical method, whereas the other is clumsy and actually far more expensive in that, outside an aerodrome, it involves numerous gratuities to the hangers-on.



Details of the Bristol Monoplane.—Above, the rudder and elevator arrangement. In the middle, the spring skid construction. Below, the pilot's seat and control gear.

The Week's Work.

A Busy Week-end.—Mr. Salmet goes to Paris and back—The Wreck of the Percival—Good Work by the Air Corps—The Flanders Monoplane in Form—Mr. Hamel's Surprising Performances—Captain Dickson Flying Again—The Deperdussins' Efficient Engines—The New Bristol-Gordon England Biplane Flying—The Latest Bristol Blériots, and Howard-Wright—The Sopwith School's Four Types.

Monday, March 4th.

Brooklands.—At Deperdussin School, Mr. Petre and Signor Sabelli doing straights in very gusty wind, but had to give up.

Tuesday, March 5th

Brooklands.—At Percival School, Mr. Percival out for circuits during short lull in afternoon. Miss Percival rolling.

At Bristol School, Mr. Merriam out to test weather, but not fit for pupils.

The Plain.—Trial flights throughout the morning, but no school flying.

Wednesday, March 6th.

Brooklands.—At Flanders School, Mr. Ronald Kemp flying strong circuits, then with Mr. "Lark" as passenger, latter afterwards doing straight flights.

At Deperdussin School, Mr. Petre for a circuit, also Signor Sabelli. Then Capt. Hamilton training for brevêt after much flying in Mexico. Evidently an excellent flier. Capt. Massy also out, but stopped by storm.

At Sopwith School, Mr. Raynham also caught in storm, and had very bad time in landing.

Walton-Edwards biplane out, Mr. Blackburn taking Mr. P. K. Turner, of The Aeroplane, as passenger for a circuit; landed in rough ground; pulled out with assistance, but without damage, and flew back to sheds.

At Percival School, Messrs. Muller and Cannon doing straights, and Mr. Percival circuits.

At Bristol School, Mr. Fleming giving tuition to Major Sir Alexander Bannerman, Bart., R.E., Commandant Air Battalion. In afternoon, Mr. Pizey with Mr. Nesham as passenger. Then latter solus. Mr. Pizey up, giving instruction to Capt. Broke-Smith, R.E., Adjutant and Instructor Air Battalion. Later with Sir Alexander Bannerman, Bart., C.A.B. Mr. Pizey testing monoplane. Later Mr. Fleming on one biplane and Mr. Pizey another, both caught in terrific squall and landed safely, but only after bad shaking, squall running straight from 3 m.p.h. to 30 m.p.h. on anemometer chart.

Air Battalion (The Plain).—First fine day for fortnight. So at 3 p.m. Lieut. Conner up on *F.4.*, soon followed by Lieut. Barrington-Kennett on *B.4.* Conditions still too bad for biplanes. Lieut. Conner came down after 10 minutes, Lieut. Barrington-Kennett doing 20 minutes, and after a little rest doing another 20 minutes. At 5 p.m. weather cleared beautifully, and wind dropped almost entirely. So Lieuts. Conner, on *F.4.*, Barrington-Kennett on *B.4.*, Hynes on *F.5.*, were flying up to 6 p.m., when the wind suddenly increased and stopped all work.

The Plain.—M. Jullerot as usual testing conditions, afterwards giving tuition.

Thursday, March 7th.

Brooklands.—At Flanders School, Mr. Kemp doing circuits and Mr. "Lark" doing straights in morning. In evening Mr. Kemp out in gusty wind.

At Sopwith School, Mr. Howard Wright out on double-control Wright, with Mr. Raynham as tutor, and later Mr. Sopwith up alone, flying well. Howard Wright biplane out for first time since return. Also Howard Wright monoplane, with Mr. "Partridge" as pilot.

At Deperdussin School, Capt. Hamilton went for certificate in morning and made excellent flights. Capt. Massy doing straights. Mr. Petre in evening doing circuits, and Mr. "Partridge" straights.

At Percival School, Mr. Percival, with passengers, doing straights. Then out solus, turned close to ground, was caught by gust and heeled sideways. No room to correct, so landed on wing-tip, smashing planes and chassis. Owing to darkness, machine could not be got in, so more damage done by wind during night. Work on repairs started at once, so machine should be out again before Easter.

At Bristol School, Mr. Fleming giving instruction to Capt. Broke-Smith, Adjutant and Instructor Air Battalion. Mr. Pizey ditto to Major Sir A. B. Bannerman, Bart, R.E., C.A.B. Capt. Allen doing straights on monoplane. Capt. Broke-Smith then out solus on biplane, making straight flights and landing excellently. Major Sir A. B. Bannerman rolling, and making good progress. In evening Capt. Raleigh practising for brevêt, flying in splendid style.

Hendon.—W. H. Ewen pupils out early, and managed to get in good hour's practice. Mr. Denys Ware was rolling, and improved into hopping stage, while Baumann and Dubois each made several excellent flights. Mr. T. S. Apcar, new pupil, joined school.

At Grahame-White School during early part of week all pupils well employed in workshops in theoretical and practical work. Most of day boisterous, but during afternoon Mr. Lewis Turner had biplane No. 2 out for three-quarters of an hour in fair breeze. Mr. Biard also out for half an hour, doing circuits on biplane No. 3, but wind suddenly increasing, he discontinued.

Air Battalion (The Plain).—In morning Lieut. Barrington-Kennett up for 20 minutes on *B.4.* in a 20 m.p.h. wind. No more done until 5 p.m., when wind dropped to about 10 m.p.h. and Lieut. Barrington-Kennett went off again for long trip round Plain. Meanwhile Lieuts. Conner on *F.4.* and Hynes on *B.3.* doing scouting and reconnaissance work, whilst Lieut. Reynolds passenger-carrying until dark.

The Plain.—M. Jullerot up on No. 66, then taking Lieut. Ercole. Mr. Gordon England out with Lieut. Fielding. M. Jullerot out, fine flight with Lieut. Antoni as passenger across country, dropping their visiting cards to officers of Cavalry School on their way. Mr. Gordon England then up on tractor biplane of own design, which brings out several new features. Mr. England flew perfectly for over half an hour, attaining and keeping good altitude. All praise should be given to constructors, the Bristol Co., and to their designer, Mr. Gordon England. Lieut. Brodigan flew for well over an hour, making figures of eight with fine bankings, and showing every evidence of being ready for his certificate and a useful acquisition to Air Corps.

In afternoon M. Jullerot again tested. Mr. Gordon England with Lieut. Fielding, and allowed pupil to take charge of controls. Lieut. Brodigan out for two good solos, landing perfectly, and Commander Schwann did first flight alone, very successfully, making good landing. M. Prier up testing new monoplane just received from Filton Works.

Friday, March 8th.

Brooklands.—At Flanders School, Mr. Kemp doing circuits in spite of wind.

At Sopwith School, Messrs. Sopwith and Raynham out together on dual-control Wright.

At Deperdussin School, Mr. "Partridge" for four excellent circuits, and then Signor Sabelli out.

At Bristol School, Major Sir A. B. Bannerman, Bart., R.E., C.A.B., out with Mr. Fleming, and Capt. Broke-Smith doing really capital straights alone and landing beautifully. Mr. Merriam and Mr. Pizey out with pupils.

Hendon.—In evening W. H. Ewen pupils, taking advantage of favourable calm, out with school machines, getting in useful practice.

At Grahame-White School arrival from America of two-seater Nieuport, on which Mr. Grahame-White had so much success and broke so many records; and weather being too boisterous for flying, pupils greatly interested in assisting the mechanics to assemble it. Lieut. Parke, R.N., visited school during afternoon and inspected new Grahame-White biplane.

The Plain.—M. Jullerot up on No. 55, followed by Mr. Gordon England on No. 43. Mr. Harrison then up with Lieut. Fielding as passenger, and Mr. Bendall up with Lieut. Ercole. Good solo flights made by Commander Schwann and Lieut. Brodigan.

Saturday, March 9th.

Brooklands.—At Sopwith School, Mr. Sopwith up on Wright, with Mr. P. K. Turner, of The Aeroplane, as passenger, and later with Mr. Eardley Billing. Mr. Raynham also out.

At Flanders School, Mr. Kemp in evening for circuits. Mr. Manning doing straights.

At Deperdussin School, Mr. Petre for a circuit in gusty wind. Bad weather good for school machines, which are now in excellent trim. All three Anzanis thoroughly tuned, and pulling well above normal, and machines trued up all over, so pupils have plenty to work on as soon as weather settles.

At Herbert Spencer School, old McFie biplane bought for school work, and all hands busy renovating it and altering tail, etc. Should be out in a week or so.

At Bristol School, Mr. Fleming giving landing instruction to Capt. Broke-Smith, who thereafter made numerous good straights alone. Then Mr. Fleming with Major Sir A. B. Bannerman, Bart., R.E., C.A.B., and later the latter doing quite good straights alone. Mr. Nesham also out, and nearly ready for brevêt.

Eastchurch.—Excellent flying day, but strong steady wind blowing. Mr. Ogilvie out on Wright biplane, and during day took up Mr. Clement Greswell, the well-known Hendon flyer, who was much impressed with capabilities of Wright machine.

In afternoon Lieut. Longmore, R.N., was out on Short No. 38, with Capt. Paine, of H.M.S. *Actæon*, as passenger. Commander Samson, R.N., flew new Short monoplane and afterwards No. 34 biplane; other aviators being Capt. Gerrard, R.M.L.I., and Capt. Gordon, R.M.L.I. Mr. Jezzi, on Jezzi biplane, and Capt. Carden, who was testing Dunne biplane. Commander Samson and Capt. Gerrard particularly good, both making fine spiral glides from good heights, Capt. Gerrard descending twice in this manner from 2,200 ft., in each case with his engine stopped completely.

Hendon.—No flying at W. H. Ewen School. Wind too strong. Miss Dorothy Prentice joined school, and is thus first lady monoplanist in England. This makes second new pupil at W. H. Ewen School during week.

At Grahame-White School too rough for pupils, but Mr. Claude Grahame-White out on new Grahame-White biplane for its first test, but controls working stiffly and wind being at some 20 miles per hour, he had to descend.

The Plain.—Work was brisk in morning, all Bristol staff being out giving tuition.

Sunday, March 10th.

Brooklands.—At Flanders School, Mr. Kemp out early, flying well, with Mr. Manning as passenger, followed by latter doing straights alone. In afternoon Mr. Kemp doing splendid banked turns, later handing over to Mr. E. V. B. Fisher, who made numerous circuits in quite his best form. Mr. "Lark," rolling in evening, broke one wheel in a rut.

At Avro School, Mr. J. R. Duigan, the Australian aviator, out practising on new type Avro with E.N.V. engine, getting short straights, pending proper tuning of motor.

M. Maurice Ducrocq out over to Walton and for several circuits on biplane, flying with usual *finesse* and landing beautifully.

At Bristol School, Mr. Merriam out early testing air. Then Capt. Raleigh for second part of brêvet, and passed in first-class style. Later Mr. Merriam up, with Capt. Raleigh as passenger, to 1,500 ft., coming down with engine switched off. Evidently now fit for any piloting necessary. In afternoon Mr. Nesham for circuits. Capt. Raleigh, with Capt. Kirk as passenger, at 300 ft., flying with confidence and ability. Mr. Fleming demonstrating to admiring crowd and finishing with spiral glide. Mr. Merriam also flying well on new school biplane. Mr. Lane rolling on monoplane and improving. Mr. Pizey also out with various passengers.

At Sopwith School, great activity all afternoon. Mr. Sopwith taking numerous passengers on Wright and Blériot. Later Mr. Raynham and Mr. Howard Wright for long flights on Wright, and Mr. Sopwith for long trips across country on Blériot, taking up three different passengers during afternoon and flying magnificently. Mr. Gustav Hamel borrowed 70 h.p. Blériot and did some really wonderful, if unnecessarily clever, flying, going up to some 3,000 ft. very steeply, and afterwards doing alarming banked turns close to the ground. Old "Family Tank" Howard Wright biplane also out, with Mr. Sopwith as pilot. Two-year-old machine flying splendidly, and showing advance of at any rate one British constructor in early stages of box-kite design. All four Sopwith School machines now in working order.

At Deperdussin School, Mr. Petre and Signor Sabelli busy all afternoon on brevêt machine and on racer with Y Anzani, both flying excellently, in spite of nasty puffy wind rising towards sunset.

Altogether busy day. Fine weather brought big crowd of people, and ground much better controlled. Mrs. Billing at *Blue Bird* very busy feeding the hungry with good things. At times almost a famine in the land owing to unexpected demand, but everyone satisfied in time.

Eastchurch.—Mr. Frank McClean, out on Short tractor biplane, which is his favourite machine, and with Commander Samson as passenger, made tour of island by way of Sheerness. Mr. Jezzi was particularly busy on Jezzi biplane, and made excellent circuits of aerodrome at high speed. His efficient little machine carries passenger quite well, and several were taken up, including Mr. and Mrs. Fowler and Mr. J. L. T. Travers. Prof. Huntington has now got his machine into running order again, and made several short flights.

Hendon.—Nearly all day weather ideal, and as usual W. H. Ewen pupils hard at work, taking every advantage of opportunity. Miss Dorothy E. Prentice (whose initials coincide with the name of the machine she is learning, the "Dep") had her first instruction in controls, while Mr. E. H. Lawford greatly improved in handling Blériot. MM. Dubois, Baumann, and Warren were all flying with confidence, keeping machine noticeably steady and making fine landings. Capt. Loraine, up from Salisbury, put up very pretty flight of 15 minutes on Deperdussin. Now handling this machine in most masterly manner, and banked turns and glide from 250 ft. were admirable. During day Mr. Ewen out on the 28 "Dep." five times in all, going across country in two flights, and giving fine exhibitions with sharp turns and sensational spiral glides. Miss Dorothy Prentice finished school-work for day by rolling school Blériot back to hangar.

At Grahame-White School, Mr. Lewis Turner out early on biplane No. 2 making circuits, but had to descend owing to Gnôme running badly. After some adjustments, however, he was soon up again with passenger, who made interesting sketches of aerodrome and surrounding country from 750 ft.. Later up again with another passenger at 1,000 ft., and finding the engine running well, made an extended tour of the surrounding country. Then up again with more passengers, one of whom took many photographs whilst in air. Mr. Biard also out on biplane No. 3, doing excellent circuits at about 50 ft. Mr. Manton also out with Mr. Turner as passenger, being new pupil and first experience in the air. In afternoon great deal of flying was witnessed, Mr. Grahame-White taking up Master Stanley Lewin for extended flight on biplane No. 2, after which the 70-h.p. Nieuport was brought out from its hangar and flown for the first time in England. After giving machine thorough test and landing with beautiful glide from 500 ft., Mr. Grahame-White took up his chief mechanic and started for Brooklands. Rising to 500 ft. in half circuit of aerodrome, he was quickly lost to view in the direction of Ealing, but after ten minutes he was forced to return, having run into very dense bank of fog somewhere over Acton. After giving magnificent exhibition of banking, he finished up with fine glide into centre of aerodrome.

At A.S.L. School very busy tuning up "Viking" and making final adjustments ready for Capt. E. V. Loraine's attempt for Mortimer Singer Prize. Engine in first-rate order. Capt. Loraine set out at great speed, but unfortunately shut off petrol supply and was unable to regulate it accurately again, consequently machine ran slowly over soft ground and wheels stuck in filled-up ditch. Few wires broken and machine strained, though landing chassis and front skid stood up nobly. Machine tuned up again by the afternoon, when Mr. Barber was flying circuits in good style, and also carried passengers for short flights.

The Plain.—Fine day's flying at the Bristol schools, 60 flights being made in day, giving aggregate of 700 miles of flight. All machines at school brought into use, and exceedingly useful work was done. Solos carried out by Commander Schwann (5), Lieut. Harrison (5), Lieut. Brodigan (4), Lieut. Wyness Stuart (4), Mr. Bendall (4), and Mr. Harrison (5).

Mr. Gordon England out doing great things on new Bristol biplane of his design, reaching good height, which he maintained for upwards of half an hour, and came down in fine glide from fully 6,000 ft. with engine completely cut off. Mr. Gordon England also up for ten tuition flights, with pupils. Lieut. Bower put in some splendid work on Bristol monoplane, starting for cross-country flight with Commander Schwann, arriving back after three-quarters of an hour. This pupil was away again almost immediately with Lieut. Wyness-Stuart as passenger. Good cross-country flight of an hour made by Lieut. Antoni. Lieut. Reynolds out on Bristol monoplane for two fine solos, and M. Julerot up for his 12,053rd flight.

A Notable Return.

At the end of September, 1910, during the Milan Meeting, there occurred the first aerial collision, when at a height of 100 ft. or so, the French pilot Thomas, on an Antoinette, dived down onto Captain Bertram Dickson's Farman, which was just ascending. Thomas was practically unhurt, but Captain Dickson broke a leg, dislocated his pelvis, and was generally so badly smashed up that for weeks he was expected to die, and for months it was thought he would be a cripple for life. How-

ever, his wonderful pluck and will-power pulled him through, so that a month or so ago he managed to clamber into the passenger seat of a Bristol biplane and went for a little flight over Salisbury Plain. A week or ten days ago he went up as passenger with Mr. Valentine at St. Cyr, on the Bristol monoplane, and chased a French dirigible.

On Sunday last, however, he definitely made his re-entry into the ranks of British pilots, and made his first flight alone since his accident. In the morning he made a short flight at Lark Hill on a Bristol biplane, and in the afternoon he went up again and made a really long flight, which was quite a wonderful performance for one as badly injured as he was. He told the writer next day, that at first it was almost like learning to fly again. But he soon picked up the knack once more, and one of the spectators vouches for the fact that Captain Dickson's landings were as perfect as those for which he was famous all over the Continent before his accident.

Mr. Grahame-White's New Move.

The Grahame-White Aviation Company, Ltd., proprietors of the London Aerodrome, Hendon, the most important and largest privately-owned aviation ground in England, the most accessible by every means of rapid transit and the nearest to the heart of the Metropolis, have found it necessary to open West End Offices at 166, Piccadilly, W., in the same building as the Royal Aero Club and The Aeroplane, to keep pace with the exigencies of their developments.

After having founded the first School of Aviation in London, after having constructed and equipped an aeroplane factory from which the new Grahame-White specially-constructed models for naval, military and commercial purposes will shortly be produced, the Grahame-White Aviation Co., Ltd., are now organising weekly meetings, exhibitions and competitions in which the best pilots will take part, and the directors are arranging a series of lectures and a College of Aviation to attract new devotees to this all-important science, thereby procuring recruits and training them in the various branches of aviation, so that they may eventually become of real value for the future defence of this country.

The declared aim of the Grahame-White Aviation Co., Ltd., is to endeavour to set England on an equal footing with the Continental Powers. The views of the directors are undoubtedly sound, for they state that until now all we in this country have done is as nothing compared to what has to be accomplished in the future.

The position which England occupies in the world makes it essential and obligatory for her not to be left behind in aerial development, for neglect in this direction may prove her undoing and cause her to lose her all-important supremacy. Consequently the Grahame-White firm do not intend to allow this country to lag behind any longer. They intend to devote all their time and energies to the realisation of the project, which will procure for this country the rank she must hold in the development of aviation. And, as they very rightly state, it is only with the help of all—the general public, the Press, members of Parliament, sporting enthusiasts, influential business men, and also the Government—that they can hope to pursue with unrelaxing energy the task they have set themselves. The Aeroplane, for one section of the Press, can promise its whole-hearted aid in this excellent object.

For Service Pupils.

Part of the new Air Corps scheme is the training of pupils at civilian schools, up to the stage of getting their brevêts. Of all existing schools there is none which affords opportunities for more experience than the Sopwith School at Brooklands, and there is certainly none where the machines are kept in more perfect order. The method of teaching adopted by Mr. Sopwith, himself one of our most experienced pilots, is practical, and at the same time calculated to put a pupil through his certificate course in the quickest possible time. The two biplanes, the American Wright and the Howard Wright, both have double controls, so that the pupil is able to follow every move of the instructor and pick up all his methods while in the air with him, thus learning much more quickly than if he had to find out his controls by himself and learn to roll at the same time.

After learning to handle the biplanes properly, the pupil can pass on to the Howard Wright monoplane with the A.B.C. engine, which is much faster than the biplanes, and comparatively simple to handle after the training on the other machines. Then, if the pupil wishes really to become a flier of the first class, he can finish his course by taking up the 70 h.p. Blériot racer, which is one of the fastest machines in the world.

The school is thoroughly well run, for Mr. Sigrist, the chief engineer, is an exceptionally fine engine-tuner as well as a plane builder and repairer, and Mr. Raynham, the assistant instructor, is certainly one of the cleverest, and at the same time the steadiest, of our younger pilots, so one can recommend the school unreservedly.

The Military Bristol in Berlin.

A telegram from Berlin states that a splendid flight was made on Wednesday on a Bristol military two-seater monoplane by Mr. Howard Pixton before His Excellency General Baron Von Lincker, General Messing and sundry staff officers of the German Aviation Corps, in a wind of twenty m.p.h.

Mr. Pixton made numerous ascents during the day, taking up several officers as passengers, and considerable interest was aroused by the flights, which were made at Döberitz, on the outskirts of Berlin.

Another fine flight was made on the Monday of last week. Mr. Pixton had his Bristol brought out, and, with an officer of the German Aviation Corps, made a long cross-country flight. The machine behaved splendidly in a wind of fifteen miles an hour, and the report given by the officer-passenger on his return after an hour's flying speaks highly of the stability and speed of the Bristol. This success, following on that recently achieved in Spain, must be very gratifying and encouraging to the British and Colonial Aeroplane Co., Ltd., who have done much to popularise aviation at home and abroad, and it is to be hoped that, coupled with the fact that both Spain and Italy have placed handsome orders for Bristols, it will not be without effect on our authorities.

From "The Field."

"Messrs. ANDRE & Co., of Piccadilly, the famous hatters, have produced a special form of headgear for motorists, which we have had under trial for some months. It is called the Dante cap, is made of the finest sheepskin, and lined with pure Nutria fur. In type it resembles the caps of the trappers of Fenimore Cooper, coming down behind and over one's ears so that full protection from draughts and weather is provided. It can be rolled into a very small compass, and is the most comfortable motoring headgear we have ever used." (ADVT.)

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THE SOPWITH AVIATION SCHOOL has the greatest variety of machines of any school in Great Britain. Tuition on Howard Wright or American-Wright Biplanes, with dual control, Blériot or Howard Wright Monoplanes. FOUR DISTINCT TYPES.—Particulars from the SOPWITH AVIATION SCHOOL, Brooklands, Weybridge.

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Useful Model Work.

Assembling.

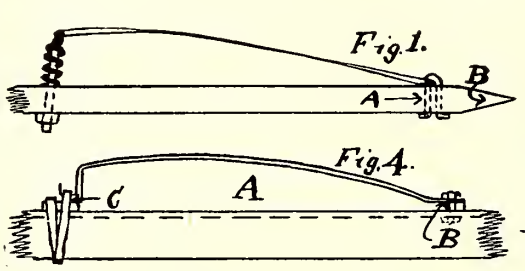
I will assume that the experimenter has by now built his rubber frame and completed his planes, and that all that is necessary is to arrange for the connection between the planes and elevator or tail and their attachment to the motor frame. The sketches below show how this should be done.

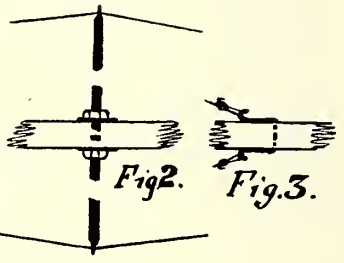
Fig. 1 shows the adjustable attachment of main plane and elevator to the frame. This frame should be of light wood, and should be at least twice as wide as it is thick. For planes of 2 ft. span I would recommend a size of 3-16 in. by $\frac{1}{2}$ or $\frac{5}{8}$, or perhaps rather thinner. The rear edge of the plane is fixed by two staples bent out of soft wire round the plane, passed through holes in the frame, and riveted on the other side as A.

It will be noticed that the frame is tapered to a point at each end, as shown at B. At the front edge of the plane is an adjustable fitting. Two pieces of stiff wire are bent to an L shape, and the short leg soldered to the front edge, the distance apart of the longer legs being half the width of the frame. A small spiral spring is slipped over each of these projecting legs, which, be it noted, must have threads cut on them. Two holes are bored in the frame to take the two legs, and nuts are put on the under side, the angle of the plane being adjusted by screwing up or unscrewing these nuts against the springs. If the planes used are fitted with aluminium or wooden spars instead of wire, the attachment fittings, instead of being bent to L shape, are screwed throughout, and passed through holes drilled in the spar, nuts being placed above and below the spar to hold the wire in place. If the plane has a trailing edge which projects beyond the rear spar, the hindermost fixing will be applied to the rear spar instead of the trailing edge, and will be similar to the front attachment.

The frame, being (for the sake of lightness) thin from top to bottom, will need staying with wire. Fig. 2 shows the method of fixing the mast. This mast consists of a piece of stiff wire, which is threaded from end to end, passed through the spar, and fixed in position by two nuts and washers. It is then softened at the ends, flattened out, and drilled to take the tie wire, the latter being fixed at the ends as shown in Fig. 3. A piece of fairly stiff wire is inserted in a hole drilled through the spar, and is then bent so as to form two hooks, from which the tie wire is strained.

Fig. 4 shows the method of attaching the main plane to the motor frame. It will be remembered that this motor frame was of triangular shape and consisted of two channel spars. First of all, a pair of bolsters, A, is made, the upper side of which match the under side of the plane, and which have extensions at the front and rear. A piece of fine wire passes over this bolster, one end being attached to a bolt which fixes the rear extension of the bolster to the upper flange of the motor frame, as shown at B. The front end of the bolster is fixed to the frame by a double turn of strong elastic passing round the frame, and one turn of this elastic is passed through a loop at the front end of the fine wire. This at the same time gives a flexible attachment between the bolster and the frame, and a good grip between the plane and the bolster. No other part of the planes or the motor frame is attached to the motor frame, the two being kept independent. To remove the planes, all that is necessary is to undo the bolt B, when the planes and plane frame can be removed bodily.





Model-Makers' Letters.

I have intended for some time to try to find room for some criticism of the letters appearing in this part of the paper, but have not hitherto been able to do so. However, I am doing so this week, since the three letters appearing in last week's issue form such an excellent example of the three typical types of letter which are received by this office.

The first letter in that issue was one from a gentleman named Wilfred Nuttall, who finds it necessary to disagree with me on most of the points with which I have dealt. I am not going to attempt to answer his letter, as I do not think any good would result from my doing so. I will simply remark that I take it as rather a compliment than when a correspondent *does* agree with me so essentially as this, his letters appear to be such as would be written by one who knows nothing of aero models, and very little of English. I will leave it to other readers to say whether they think he is justified.

The second letter is a typical letter of a business firm who are naturally glad of an opportunity of arguing about their wares in the editorial portion of the paper.

The third letter is of the type which unfortunately is comparatively rare; a well-thought-out and well-written letter from an experimenter who finds his own results to disagree with those of which he reads, and who says so in a courteous and reasonable manner. I cannot understand why it is that so few model makers take the trouble to verify or controvert published results. Letters giving the results of such experiments are always most interesting to read, and it is this type of letter beyond others which has possibilities of being instructive to others.

With regard to the particular point dealt with by Mr. Vessey, I can only say that results of the experiments I have made up to date seemed more or less to coincide with the figures as stated. There is, however, one possibility of error. My original experiments were made some little time ago, and the table was worked out within the last three weeks, and I have been forced to rely somewhat on my memory to supply the agreement between theory and practice. It is quite possible that I have misremembered the pitch of my propellers, or made some such foolish mistake. Unfortunately I have now very little time to spare for experimenting on my own account: nevertheless, I intend to make an effort to find time for some further experiments.

In the meanwhile, I will ask Mr. Vessey whether his velocity tests were taken by measuring slip-stream velocity or by observing the velocities of machines, and should also like to know how he has proved that a propeller of a given diameter will always give the same velocity of air if the motor is constant, irrespective of the pitch of the propeller.—P. K. T.

MODEL CORRESPONDENCE.

Sir,—I am pleased to see that you are giving a place in your paper for news about models. Now, out of four aero papers I take in, there is not one that gives information about the scientific side of model-making, but devote nearly all their available space to confabs on whose model flies the greatest distance or remains longest in the air. No douht these models are all right for sport, but what I want to see are models built to scale, with power in comparison to drive them.

Why do not our model-makers follow in the footsteps of Langley and Hargreaves? for the model-maker of to-day has a better chance of success than these men had in the early days of flight. Also, more reliable data would be gained, and in the case of a man wanting to build a full-size machine would save a lot of expense.

Therefore let me urge you to strike out in this direction, for, as in many other matters, the best designs are those generally which are the simplest. The main surfaces which carry most of the weight of a model may be in the form of monoplane, biplane, or triplane, and should be as few as possible. These surfaces are generally mounted on a built-up, extended frame, at one end of which is carried a smaller surface set at a slight angle to the main surface.

The functions of these small planes are to control the elevation and stability of the models. These small surfaces may be placed either in front, as in the Wright machine (the early Wrights), or in the rear, like the Blériot type, and its area

may vary from one-sixth to one-quarter of the area of the main surface.

Then, again, they may be placed, one in front and one in the rear, as in the Farman machine. When a small surface is placed in the front, it should be turned up at a slight positive angle to the main surface, thus forming between the two a dihedral angle. Then, again, when placed in the rear, the small plane should have a slight negative angle. The effect of this is to right the model if it dives.

The steering is usually effected by a small vertical rudder and a fixed fin, and they also increase stability. A biplane is usually considered to be somewhat more stable than a monoplane, but I have seen the latter fly better and remain very stable, so long as the surfaces remain rigid, though everybody has their own opinion on this point. It is of supreme importance that the surface should be able to withstand a certain amount of rough usage.

They should not be too fragile, and should be so arranged as to be easily removed. Also, they should be made as light as possible, though it must be remembered that weight is, after all, only a secondary consideration.

For models, more so than in the construction of their prototypes, it is advisable to use wood wherever possible, because (1) it is superior strength for weight to any other material, (2) it offers greater variety of choice, (3) it is cheap, and can be worked more easily than metals. Also, when the metal is drawn into light tubes, or rolled out into thin sheets, it is not satisfactory for our purpose, for it does not possess local stiffness—that is, it soon crumples or buckles up.

It is, of course, necessary to make use of metal in the shape of nails, screws, stay-wires, small plates, and brackets, etc., but what I want to point out is that there is no real advantage in using metals for the surfaces or framework of model fliers. Of course, I am well aware that aluminium and magnalium are much advertised for this kind of work; but, as I have already pointed out, there is nothing to be gained by the use of them, except in the case of detail work.

As to the woods (for the information of which I rely on Sir Hiram Maxim's book, "Natural and Artificial Flight"), it may be roughly stated that the heavier the wood the tougher it is and the better it will bend. Generally speaking, the fibres of wood are bedded in a gum, which, under heat, softens, setting hard again when cold.

The most suitable woods for our purpose are as follows:—

American whitewood is a very light and easily workable wood, but is very weak, and apt to break off short.

Yellow pine is light, strong, useful for straight parts, and is easily obtained. See that this wood is well seasoned before using, as this makes a great difference in its weight.

Spruce is stiffer and slightly heavier than the above, and ordinary spruce has a great tendency to warp.

Silver Spruce is better, and is a most beautiful wood.

Mahogany.—Honduras mahogany is probably, weight for weight, the strongest wood there is.

Cedar is somewhat similar.

Birch—fairly tough and light.

American elm—very tough and fairly light, having a fairly close grain.

Ash—very tough and close in grain.

The three last-mentioned woods are extremely suitable for curved surfaces and parts that come in contact with the ground, and as a rule, when damaged, break with a long fracture, so that the parts can be bound together again.

Split bamboo is very tough, and I have found that canes that are sold for use in gardens are very useful, being about ½ in. diameter and very cheap.

A wood that is most useful for framework and can be easily bent is *hickory,* and for long, straight parts of framing silver spruce is most suitable, and can be obtained from all model-makers, planed true, in convenient sections, such as ⅛ in. by 3-16 in., 3-16 in. by ¼ in., and so on, up to ⅜ in. by ½ in.

American elm or birch may be used in the place of hickory, and can be steamed to the shape required. A. P. Peet.

AN OLD FIRM'S NEW CATALOGUE.

The list of Aero-Models and Accessories which have just been issued by S. Summerfield and Co., of Melton Mowbray, is well worthy of the attention of all serious aero-model constructors. The first item in it is the series of "Ideal" petrol motors and various powers from ½ to 50 h.p., which are very cheap and extraordinarily light. There are various other petrol motors and accessories, and also some steam sets and rotary CO_2 motors. The rest of the list comprises the usual model accessories, besides one or two novelties (e.g., the McNeill wire-strainer) at extremely reasonable prices.

CLUB NOTICES.

Hackney and District Aero Club.—Saturday, Messrs. Hill, Gittus, Marmin, Louch flying. General meeting March 22nd, Spensley Hall, opposite Fire Station, Brooke Road, N., 7.30 p.m.—B. H. Longstaffe, Hon. Sec., 47, Jenner Road, Stoke Newington, N.

Ealing and District Aero Club.—March 9th, Messrs. L. Roche, C. Davies, C. Chilcott, R. Hall, G. Beeching, C. Roche and L. Kirchner flew. Sunday, 10th, Messrs. L. Roche, R. Hall, C. Davies, J. Pratt, C. Roche, and C. Chilcott flew. Next Saturday eliminating trials for Paddington contest. Wednesday, 20th, meeting at Club Room, 40, Pittshanger Lane, Ealing, at 8 p.m. Note change of address.—B. J. Kirchner, Hon. Sec., 1, Queen's Gardens, Ealing, W.

Paddington and District Aero Club (1910).—Saturday, reception by President (Mr. V. E. Johnson, M.A.) He offered prize for club competition in September for tractor monoplanes rising off ground. Saturday, Parkside, duration trials for selecting team to oppose Ealing and Districts Club. In evening at workshop lecture on Propellers, how to find pitch, etc.—W. E. Evans, Hon. Sec., 133, Buchanan Gardens, College Park, Harlesden, N.W.

Brighton and District Aero Model Club.—Bate flying extraordinary distance in wind on 9th at Shoreham. On three occasions model (1-1-P2), outside 'drome from hangars, well over 500 yards. Members are reminded of the competition for Mr. Townsend's prizes. Communications to A. von Wichmann, "Kingsleigh," Kingsway, Hove.

St. Mary's Model Aero Club.—Monthly competition held Saturday. Point-to-point contest 120 yards by 80 yards rectangular. Results:—1, E. Restall; 2, H. Harper; 3, E. Eburne.—H. W. A. Johnson, Hon. Sec., Vicarage, Kingston, Portsmouth.

Aero Models Association (N. Branch).—Finchley, Saturday, Messrs. Corder, Hendsley, King, Partridge and Root flying. March 16th, open "distance" competition for "Mann" set of parts.—M. B. Ross, 15, Highgate Avenue, Highgate, N.

Blackheath Aero Club.—Kidbrook, "point-to-point" competition postponed. Messrs. Slatter, Williams, Brown, A. B. Clark, Holland, Hoch, Peter, Jarvis, Egelstaff, and Pizey flying. At Grove Park, Mr. A. E. Woollard flying. At Lee, Messrs. Coomber, Conolly, Dollittle, Plummer, Trask, Hoch, Bailey, Brough, Jarvis, and Richards flying. Next Saturday flying at Kidbrook, Blackheath, Grove Park, Lee and Crofton Park.—A. E. Woollard, Hon. Sec., 48, Hafton Park, Catford, S.E.

Birmingham Aero Club.—Pleasant evening at Bell Inn, Monday week. Lecture on Gliding by G. Haddon Wood. Club forming team of model fliers to visit other clubs. Messrs. E. Trykle, Lunn, M. Vale, G. Wilde, Rogers, G. Baker, V. L. Thompson, W. V. Jones and G. Haddon Wood flying.—G. Haddon Wood, Joint Hon. Sec., 8, Frederick Road, Edgbaston.

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Edited by CHAS. G. GREY. ("Aero-Amateur")

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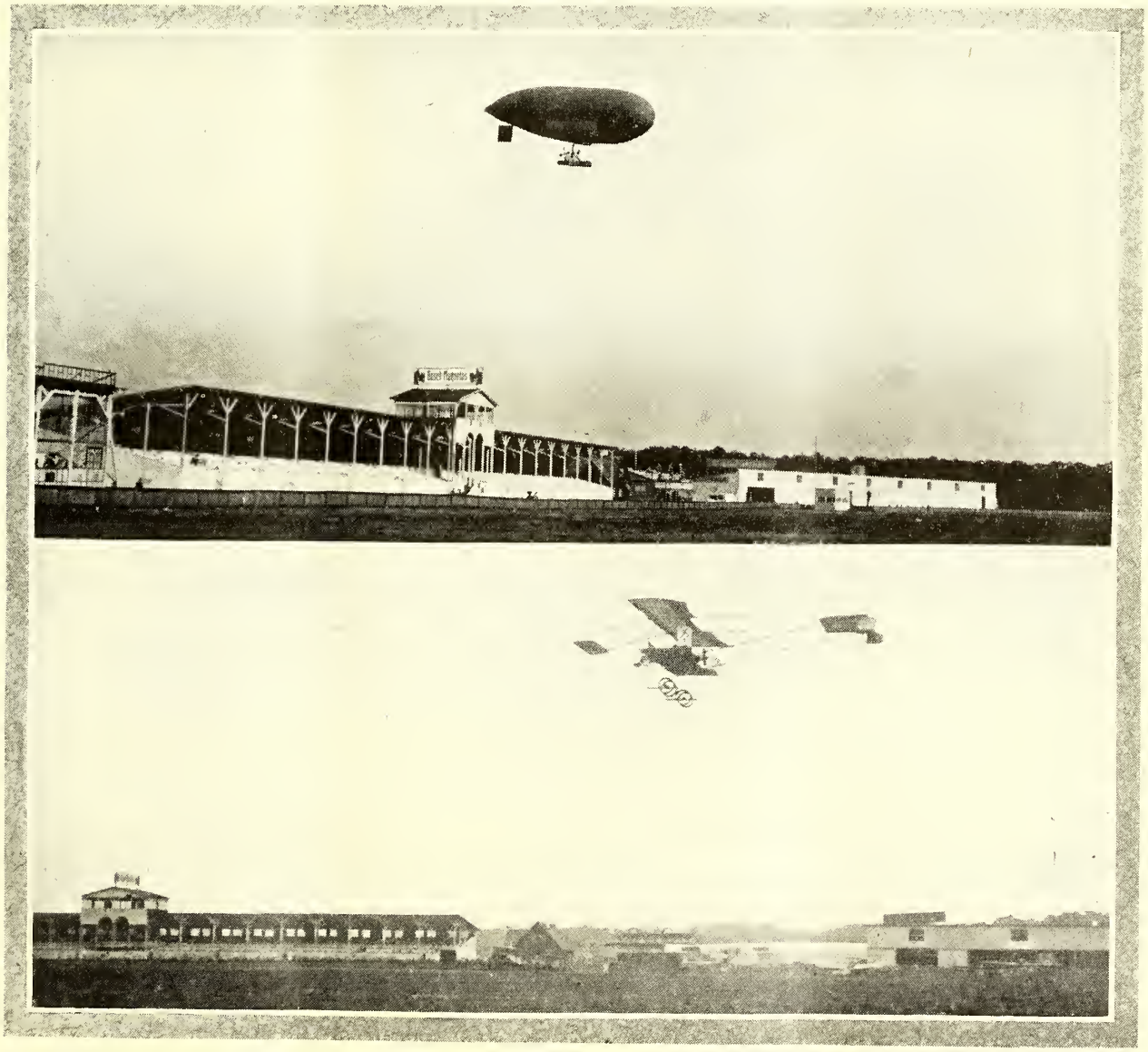
OUR GERMAN RIVALS.



The great German Aerodrome at Johannisthal. Above is "Parseval VI" and below an Aviatik biplane, with quaint side-curtains. The elaborate buildings of the aerodrome show how far the Germans are ahead in organisation. The upper photograph is kindly lent by the Hon. Lady Shelley, and the lower one by Mrs. R. F. Scott.

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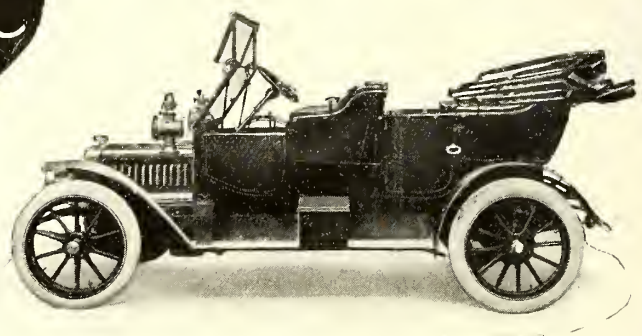

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MATTERS OF MOMENT.

A QUESTION OF TIME.

One of the most extraordinary features of the general discussion on the new Air Corps scheme is the attitude adopted by a contemporary which one would have expected to have supported British industry if it had a working knowledge of facts, even if it does not consider the interests of British manufacturers. It states that it "cannot avoid the admission that there is a great deal of sound policy in the Government decision to go to France for a certain number of the first batch of machines," and that "undoubtedly our good friends across the Channel are ahead of us in the meantime."

It certainly admits that it would have been almost as well if the Government had stipulated that all aeroplanes purchased on its account should at least be built here, but that on account of the urgency of the case, and in order to save delay in the establishing of factories and plant by French firms in this country, it is unavoidable that in the present instance we should have to go abroad for machines.

Apparently the points which the journal in question endeavours to make are that, if machines are ordered abroad, they can be delivered much more quickly than can British-built machines, as well as being better machines when delivered. As a matter of fact, the French factories which are turning out machines of proper efficiency and safety to be worthy of use by our Air Corps are so well employed on orders for French and other Continental Governments that they are absolutely unable to deliver their latest type machines quickly, and, in any case, they do not particularly care whether they get British orders or not.

Against this may be set the fact that any one of half a dozen British aeroplane constructors is perfectly willing, and has works properly equipped, to turn out exact copies of any French machine just as quickly as the machines can be turned out from the French factory. If it is particularly desired to have machines of French design, there would be no difficulty in French constructors arranging with existing British firms to build their machines for them in this country at once on a profit-sharing basis, and there is no doubt that a working alliance between a leading French firm and an existing British constructor would be a thoroughly good arrangement for both parties. We have already had exact copies of French machines built in this country, which were admitted by French pilots and engineers themselves to be better than the originals from which they were copied, and in several instances these machines have been built very much more quickly than they could have been procured from the French firms themselves.

The Francophile section of the authorities may, however, argue in support of the opinion of our contemporary that, even if machines were ordered in this country, it is impossible to procure engines for them. This interesting state of affairs has been produced to a certain extent by the fact that the Air Corps Factory group, doubtless with the idea of furthering their own plan of campaign, have practically created a corner in certain makes of French engines, which, through its influence with the War Office, it insists on having fitted to such British machines as it may be pleased to order from British constructors.

One might suggest, therefore, that a considerable amount of time and money might be saved by ordering the machines alone from British constructors, and having them fitted with engines supplied by the Air Corps Factory, pending such time as the continuation of the present agitation may convince the disinterested—or, to put it at its best, the more enlightened—party at the War Office that British engines already exist which can fulfil all the functions demanded from the French engines, and that with proper encouragement better engines still can be built in this country.

OFFICIAL HALF-TRUTHS.

In commenting upon the official statement concerning aerial defence last week, the writer pointed out that it was almost impossible to believe that the actual aviators on Colonel Seely's committee were in agreement with Colonel Seely's own statement when he said: "The technical members of my committee, themselves flying men, realised, with the full approval of the whole committee, that the first essential was efficiency and safety, and it is a fact that in many respects France has gone a long way ahead of us."

After inquiries through numerous indirect, but none the less reliable, channels into the opinions really held by various members of the committee in question, prior to their association with that committee, it is now possible to suggest, with something very closely approaching to absolute accuracy, the exact process by which this extraordinary statement was evolved. The statement is cleverly designed, so that, while literally true, it gives an entirely misleading impression.

The facts seem to be that the practical aviators on the committee agreed, as Colonel Seely certainly pointed out, that "the first essential was efficiency and safety," but there the opinions of the aviators

stopped, and it was Colonel Seely who committed himself to the further opinion that "it is a fact that in many respects France has gone a long way ahead of us." This, also, is true in that, thanks to the supineness of the Government, France has some 200 effective war-planes, whereas we have only five, but is not true that France is ahead in design or construction.

So far as the necessity for efficiency and safety is concerned, the committee is undoubtedly correct; but those who are in touch with aeroplane constructors know that British machines can be, and are being, built of as great efficiency as any in France, and in most cases with a greater factor of safety. It therefore remains to trace the Francophile opinions of Colonel Seely to their source. The aviators stand acquitted at once. Most of the rest of the committee knew nothing of aeroplanes, and were only there as military organisers. So the opinion must of necessity emanate from that section of the committee which has its interests wrapped up in the Air Corps Factory.

The process of reasoning which evolves this attitude appears to be that, if the majority of the officials at the War Office and the people in this country generally can be convinced that British constructors are incapable of making efficient and safe machines at this moment, a certain number of machines must be bought abroad, but a greater number still must be built by the Air Corps Factory. The building of more machines by the Air Corps Factory means, of course, a bigger establishment, employing more hands and with the control of more money, which entails, naturally, bigger salaries for its officials and more well-paid subordinate jobs for the friends and relations of these officials. The preparations for great activity at the Air Corps Factory are proved by the purchase of large quantities of tools and machinery, as noted in The Aeroplane prior to the publication of the Army Estimates, by the corner created in certain French engines, and by the recent purchase of no less than £600 worth of wood, enough to build some forty machines. This wood, it should be noted, is ordered cut to certain lengths and scantlings, and so is obviously not intended for miscellaneous repairs.

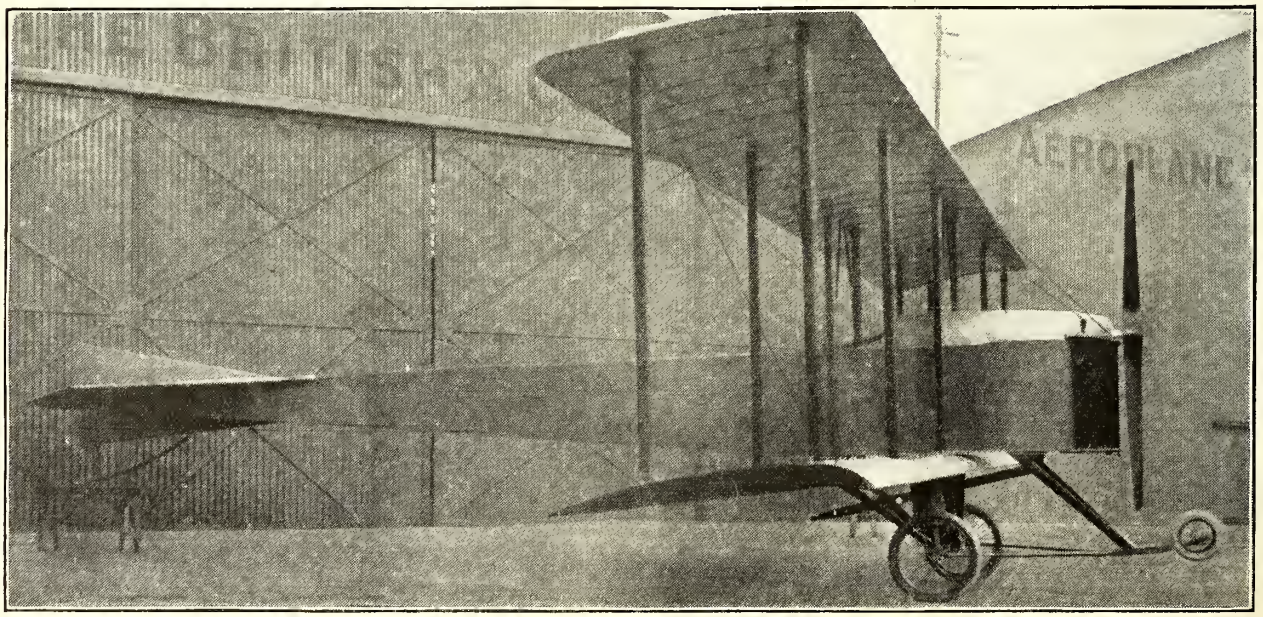
A certain clique at the War Office is very closely mixed up with certain of the men occupying good positions at the Air Corps Factory, both by ties of relationship and by common interest, and it therefore appears that the whole of this scheme to boycott British manufacturers, so far as it is possible to do so in the face of public agitation, is being carried out by a very clever distortion of facts, and Colonel Seely is unfortunately the victim.

It is to be feared that it will be necessary, unless the present boycott is raised, to enlist the good offices of sundry people who are able to assist in giving publicity to the facts, and insist on a close investigation into the whole administration of the Air Corps Factory, the system by which appointments have been made there ever since the start, the way in which the older employees have been superseded by the protégés of certain officials, and generally to expose the favouritism and incompetence which exists. Public scandals in Government departments are always most regrettable, but the future safety of the country is so closely connected with the efficiency of our Air Corps and with the arrangements for an adequate supply of British-built aeroplanes and engines in the immediate future that, unless the position improves, the necessary, if unpleasant, steps must be taken.

The Waterflyers' Canticle.

Sounds the loud timbrel o'er Windermere's sea,
For *Water-Bird*'s triumphed, her course is now free.
Sing, for the Protest of Rawnsley is broken—
Committees, Petitions, so splendid and brave.
Sing, for the Sub. of McKenna has spoken,
And free may the hydroplane rise from the wave.

March 15th. J. J. W.



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AIR CURRENTS.

The "Airman's" Wooing.

(Lines inspired by the reported title of an American song, called "Spooning in my Aeroplane"—a juxtaposition of ideas which recalls the Irishman's classic objection to whisky-and-water, when he said it was "Two good things spoilt.")

She was pretty and dainty and quite divine, with plenty of cash of her own,
And I wanted to ask her if she'd be mine, but I never could find her alone;
So I asked her to come for a passenger flight—she had said she would "*Love* to fly!"
Just she and I in my best box-kite. "I shall manage it now!" thought I.

I helped her tenderly into her place—we were seated side by side;
"You'll see that now we shall go the pace!" I told her, with conscious pride;
But we didn't get off for an hour or so, for the motor refused to run,
And she said, "I'm told they never *will* go! Oh! *isn't* this glorious fun?"

I couldn't begin in the way I had planned, when we did get into the air,
For I wanted to start by holding her hand, and I hadn't a hand to spare;
And it isn't so easy as it may seem when you're sketching things out at home,
To yell sweet nothings above the scream of a seventy horse-power Gnôme.

I shouted "Darling!" into her ear, and we rocked in a terrible way;
We steadied again, and I tried with "Dear!" and she answered, "*What* did you *say?*"
The engine stopped as I cried, "How sweet——" but I hadn't a chance to explain,
For an air-hole dropped us some forty feet before it started again.

"Do say I may hope"—once more I tried (and she said, "There is *something* cracked!")—
"To steer through life with you by my side"—here the rudder refused to act;
"It will break my heart if you say you'll not"—and I gave it up in despair,
As a cylinder head blew off, and shot like a cannon-ball into the air.

We landed at last, though I don't know how, or which way up we hit;
I am black and blue with bruises now, but she wasn't hurt one bit;
And she said, as I helped her out of the wreck, "I'm sure I'm a *horrible* sight,
And—I'm not in a *hurry* to break my neck, but thanks for a *beautiful* flight!!!"

Then Brown came up in a brand-new car (I always detested Brown),
And said, with a grin, "Oh, *here* you are!" and motored her back to town;
And if ever I *am* such a hopeless flat as to ask a girl again,
I tell you straight, you can bet your hat it's not in an aeroplane!

M. L. E.

Overheard Conversations.

THE SEEDY INVENTOR DREAMS.

(Scene: Wealthy Financier, hereafter known as W. F., seated in a comfortable chair in front of desk, Enter unto him servitor.)

Servitor: Gentleman to see you, sir!

W. F.: Who is he?

Servitor: Gentleman of the name of Jones, sir; says he's an aeroplane inventor.

W. F.: You don't mean to say so! Send him up at once.

(Enter Seedy Inventor, hereafter known as S. I.)

W. F.: Come in! Take this chair! Have a cigar! Make yourself quite at home. Will you have a whisky and soda? Certainly; say when. Now we can talk comfortably.

S. I.: I am sure this is very good of you.

W. F.: Don't mention it. Please tell me what I can have the pleasure of doing for you.

S. I.: I have got a little invention of mine I should like to show you, on aeroplanes——

W. F.: Aeroplanes! Really! How ripping!!

S. I.: You see, my aeroplane will go straight up into the air without running along the ground, and——

W. F.: What a splendid idea! I am so pleased you came in! I suppose you want me to finance it?"

S. I.: Yes, I thought just a little company with a capital of ten thousand pounds——

W. F.: I never bother with companies. Take too much time. By the way, don't you think twenty thousand would be better? There's many a good thing spoilt for insufficient capital.

S. I.: Yes, perhaps it would be better.

W. F.: I'll write you out a cheque at once. Here! Where's my cheque book? (Rummages among papers, finds it, writes out cheque rapidly). Shall I cross it?

S. I.: I'd rather you didn't.

W. F.: Just as you like. (Hands him cheque.)

S. I.: Thank you very much.

W. F.: Not at all! Only too pleased! By the way, give me a fair share of the profits, won't you, old chap? I leave it all to you. If you want any more cash, don't forget to look me up. I'm so glad you came in! Thanks so much!

S. I.: You are most kind.

W. F.: Not at all! Good-bye!

S. I.: Good-bye!—(He wakes up, roused by the postman's knock, and receives a letter from the 217th capitalist whom he has approached, which says: "Aeroplanes! No, thank you! Aeroplanes cannot be a commercial proposition either for use or sport till you can invent some sort of parachute by which an aviator can descend safely if his engine stops, or if his centre of pressure goes too far forward.") W. O. M.

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STAERO for Aeroplanes

Naval Aviation and the Air Corps.

BY W. E. de B. WHITTAKER.

A fortnight ago the printed abstract of the Army Estimates was published, and a week ago Colonel Seely made his statement thereon in the House of Commons. With that indefinity dear to the hearts of perplexed but hopeful politicians he sketched a brief outline of the official intentions in regard to aeronautics.

For reasons not yet adequately explained, it has been decided that the Air Corps shall be hybrid in nature and consist of sailors, soldiers, and civilians. The expenditure consequent on this formation is to be divided between the supply votes of the two Services in a manner still undisclosed. The Army Estimates, which supplied definite statements as to how much money is to be spent on aviation during the year, only lays down on the broadest lines the way in which the money was to be spent. For instance, Colonel Seely spoke of the intended purchase of 131 aeroplanes by the Air Corps, but gave no indication as to whether the machines to be purchased by the Navy were included in that number. Therefore one has had to suspend final criticism until the intentions of the Admiralty were officially announced.

The Navy Estimates were published last week and, one regrets to say, do not throw much light on the confused question. No such details even as those published in the Army Estimates are given, and in only two places, in the brief published statement of the First Lord of the Admiralty and in the Navy Estimates, is aviation mentioned.

The Supply of Officers and Men.

In the Statement, under the heading of "Personnel," there is a paragraph as follows:—

"The development of aviation for naval purposes has been the subject of special attention, and all possible measures have been taken to procure an adequate and immediate supply of trained officers and mechanics."

The Cost of the Combined School.

And in the Estimates, under Vote 10 (Works and Buildings, etc.), Sub-Head B, Part 1 (New Works, etc.), is an entry of £20,000 as a half-share supplied by the Admiralty towards the £40,000 to be expended on the formation of a joint aviation school on Salisbury Plain. These figures do not tally with the figures quoted in the Army Estimates, but no doubt there is good reason for that.

In Paragraph F, Section III, of Vote 8 (Shipbuilding, Repairs, etc.) appears "Contribution to War Department towards cost of joint Military and Naval School of Aviation, £14,000," a sum of money which appears in the Army Estimates also. The total sum, therefore, allotted to aviation by the Admiralty is £34,000, all of which is ear-marked for school purposes.

Expansible Expenditure.

It is obvious from what is known of work in progress that the naval expenditure on aeronautics is not restricted to the small sum mentioned. In the case of the War Office it is possible to publish in close detail the Estimates for the year, owing to the fact that in times of peace the routine of the Army proceeds with regularity, and there is little reason or danger of sudden increases of expense.

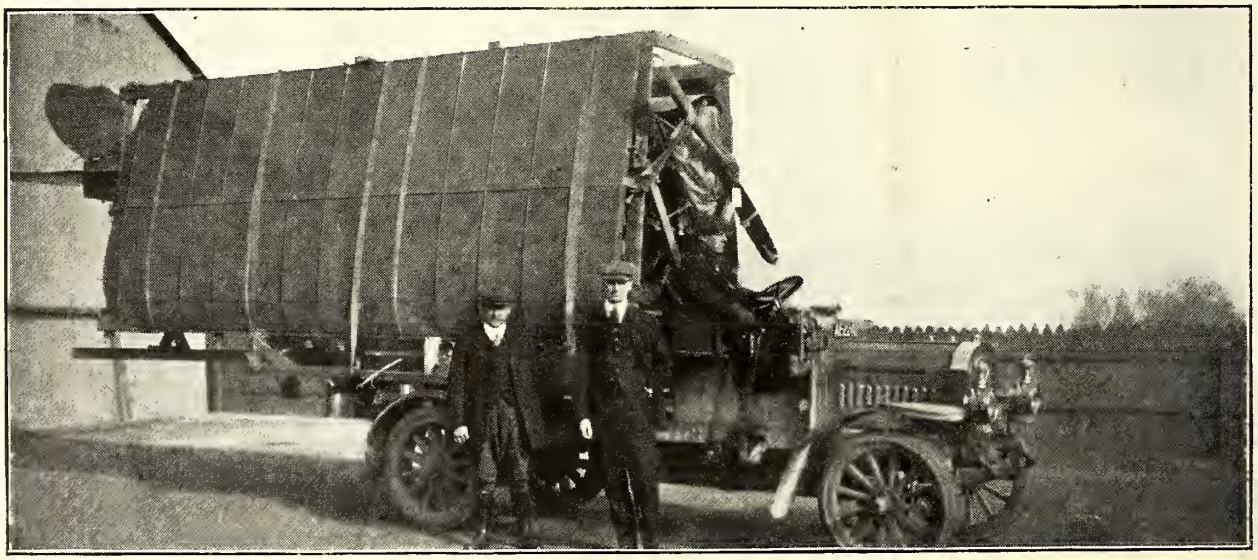
The Navy works under different conditions. Political trouble in any part of the world may add largely to the naval bill owing to the necessity of despatching ships of war to the scene of action in order to safeguard British interests. Shipwrecks and collisions between ships, again, alter things. A greater number of experiments are also made in the Navy and at varying cost. It is therefore customary in the Navy Estimates to allot large sums of money under various heads without going into detail as to the method of expenditure. The money for aviation purposes consequently cannot be traced by merely reading the Estimates, and one can only wait until the First Lord makes his statement in the House of Commons. There is no reason to believe that Mr. Spencer-Churchill and his advisers have not made adequate provision for the necessary experimentation in naval aeronautics, though, as a matter of Service custom, it may not be disclosed.

Rational Policy.

The present practice in regard to the spending of money on aviation is to make the Army grant considerably larger than that of the Navy, though the lines of progress are clearly defined in the case of the former and are undecided in the case of the latter. Nothing of importance has been decided as to the exact use of aeroplanes at sea, and everything is in the experimental stage.

A brief résumé of the principal details requiring the spending of money may, therefore, be of interest.

The training of officer-pilots and mechanics is, of course, of first importance. Though no indication is given as to the number it is intended to train, there is



One of the Bristol Military Monoplanes packed for rapid transit. Mr. Hotchkiss, the Bristol pilot, is standing by the driver.

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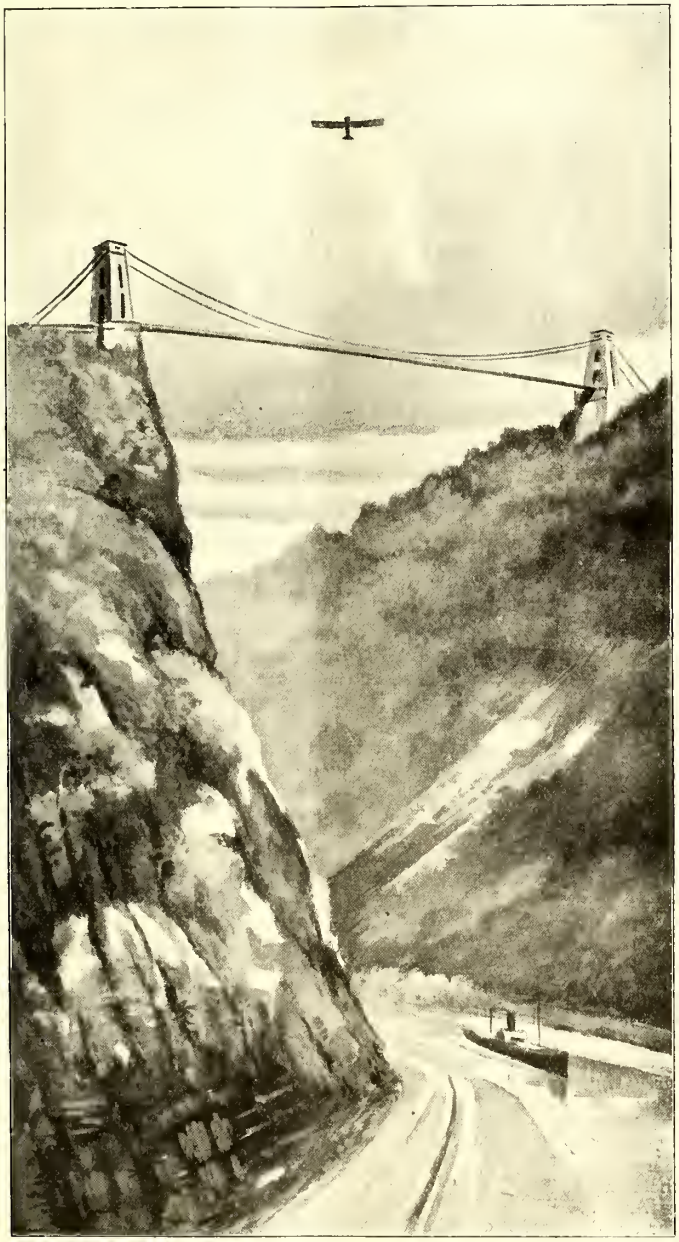

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no question that by the end of the year there will be in existence an efficient, if small, corps of naval pilots. As to mechanics, the Navy has in its ranks the best material available, and surprisingly little training will be required.

Machines.

The purchase of machines is of equal importance, but it is unlikely that many will be ordered until the authorities have decided on the type most suitable for use at sea. The only means of arriving at a decision of any value is by comparing the results of innumerable experiments. Compactness and speed are both desirable—the first because men-of-war have but a limited storage space at their disposal, and the second, because of the increased stability gained. My personal opinion, for what it is worth, is that the biplane will prove to be the most useful type for naval work. Floats can be attached with greater ease than to a monoplane. There is also some difference in the view obtainable in the two types, usually in favour of the biplane, though the fitting of transparent panels in the wings of a monoplane removes this objection to a large degree.

Mother-Ships.

The provision of a mother-ship for hydro-aeroplanes is another direction in which money can be spent. Even if it is decided not to employ a flush-decked vessel, of the type referred to in my article on "Aviation in the Navy" in these pages some weeks ago, it will be necessary to fit out a ship on which experiments in alighting and rising may be made. Landing in a grass field of great smoothness is of little use as practice in landing on the deck of a ship pitching and rolling in a heavy sea. Experience must be gained under sea conditions, and money must be provided for the purpose. It would certainly not be waste of money to build a ship specially for aviation work. Many things could be learnt by such means.

The Cost of Experiments.

The destruction of aeroplanes and engines whilst carrying out alighting practice at sea will also make a hole in the money available. Accidents will happen even in the best-regulated of air corps, and it is too much to expect immediate success from experimental machines. The effects of sea-water on the engines and planes of amphibious aeroplanes will certainly be bad, and until some really waterproof fabric and sea-proof metal is employed there will be constant trouble from this source.

Types of Floats.

Little is known at present as to the best type of floats to employ and of what material to make them. A great deal of information regarding them can be gained by practice in harbour waters and lakes. The experiments on Windermere and at Barrow in England, in the bay of the Seine and on the southern coasts of France, and on the coasts of the United States of America have all been of considerable value; but much could be done by a properly organised body not short of money, such as the naval wing of the British Air Corps. It is understood that trials of floats are being made in Sheerness Harbour.

Bomb-Dropping Apparatus.

The testing of different forms of bomb-dropping apparatus is another matter which will possibly be undertaken by naval aviators, though for the present the dropping of explosives from aeroplanes and balloons is forbidden under the terms of the Hague Convention. It is well to prepare for possible eventualities. Humanitarian resolutions made while the world is at peace are strangely forgotten in the heat of war, and the passion of retaliation brings about strange results.

It is clear that the naval wing has much work before it of an experimental nature and at great cost. An unstinted supply of money is required and freedom of action should be allowed to those officers in whose charge the naval aerodrome will be. Great Britain has the money and the men, and only the machines are lacking.

Co-operation between the naval authorities and native-born aeroplane constructors will remove this drawback.

Mr. W. Spencer-Churchill's Statement.

In the course of the debate on the Navy Estimates, Mr. Spencer-Churchill made the following statement concerning aviation :—So much has been said during the Army Debates in the last few days on the subject of aviation that I purpose only to make a passing reference to its naval aspect this afternoon. Early in November my noble friend the Secretary of State for War (Lord Haldane) and I agreed together that the War Office and the Admiralty should work together as far as possible in the development of this vitally important new Service. A sub-committee of the Committee of Imperial Defence was set up, which, under the guidance of the Under Secretary of State for War (Colonel Seely) has produced a bold, far-reaching, and carefully-considered scheme. The Admiralty are very much indebted to my right hon. friend for the service he has rendered in this connection. We have now acquired some land at Eastchurch, adjoining that of the Royal Aero Club, who courteously gave us the use of their aerodrome for flying purposes. The buildings and sheds for a naval aviation school are in course of erection. A considerable number of aeroplanes both for training and experimental purposes have been purchased, principally in England, and some of these are being adapted to the special needs of the Navy. We do not, of course, require in the Navy to develop aviation on the same great scale as in the Army. We have already a certain number of good naval aviators, and we are going to increase them as rapidly as possible during the year, and I hope it will not be many months before regular flights of naval aeroplanes can be attached for ordinary service to the various squadrons and commands of the fleets. I can assure the House that the greatest importance is attached by us to a thoroughly good and effective development of this service, and money will not stand in the way of any necessary steps.

Mr. Lee : How much?

Mr. Churchill : We have taken in the Estimates as much as we can spend. Although there is no money taken in the Estimates for the purchase of dirigible balloons or dirigible airships, it ought not to be supposed that that subject is not also engaging unremitting attention, especially the latest developments.

Mr. Arthur Lee, in replying, said : The right hon. gentleman said something about aviation. I am glad to know that that is receiving attention, and that measures, if possible, will be taken, according to the Memorandum, but I have been unable after the most diligent search, to find any provision whatever in the Estimates for this. No doubt the provision is there, but everyone knows how difficult it is to find one's way about in the Estimates, even after many years' experience. I hope the representative of the Admiralty will tell us later exactly what is to be done.

Our German Rivals.

Several interesting photographs of the Johannisthal Aerodrome and the suburbs of Berlin and *Parseval VI* have been kindly lent to The Aeroplane by the Hon. Lady Shelley, who writes that they were taken during her recent trip in *Parseval VI*. That of the aeroplane at Johannisthal is lent by Mrs. R. F. Scott, the wife of Captain Scott, the Antarctic explorer, who has recently been flying in a Rumpler-Etrich. The Aeroplane is also indebted to Mrs. Scott for the photographs of the Harlan, Grade, and Trinck machines which have already appeared.

Lady Shelley says that *Parseval VI* runs daily, in fine weather, from Johannisthal to Berlin and back, carrying fourteen passengers and a crew of four. The machine makes a circuit over the city of Berlin, and the round trip lasts usually about an hour and a half.

On occasion *Parseval VI* is let to commercial firms for advertising purposes, and is often to be seen at night, sailing over Berlin, with the name of the firm which has hired it illuminated by electric lights on the car of the machine. As Lady Shelley very appositely remarks, the Germans are far-seeing enough to realise the commercial possibilities of this new means of locomotion.

Austrian International Aviation Meeting.

An international aviation meeting will be held at Vienna from June 23rd to 30th, 1912, under the auspices of the Aero Club of Austria. Among the various events there will be competitions for height, speed, vertical speed, cross-country race, variability of speed, bomb dropping, landing, pursuit of balloons, etc. The prizes will probably amount to about £7,000. Further particulars can be had on application to the Royal Aero Club.

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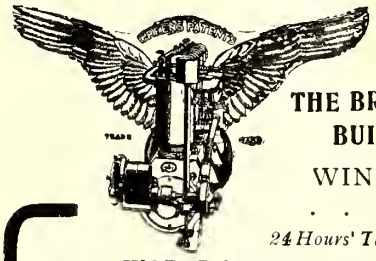

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French Military Aviation.

M. Blériot is the first constructor of aeroplanes to produce an aeroplane specially designed to meet the special requirements of military transport. The packing into small space of aeroplanes is, in such machines, of the greatest possible importance, and how far M. Blériot has succeeded is shown in the accompanying sketches of the 1912 "Artillery type" Blériot.

The fuselage is articulated and allows the tail to be folded over the back of the machine. The elevator is also of special design, so that both sides of it can be folded over its centre part, reducing the width to that of the front of the machine. The shock-absorbers can be detached in a few seconds and the wheels can then be raised behind the chassis, thus lowering the machine about 2 ft. When the machine is folded ready for transport the dimensions are:—Length, 16 ft.; width, 6ft. 6 in.; and height, 7 ft. 4 in.

An official trial of the resistance of the new wings of the 1912 Blériot monoplane "Type XI" was made on January 19th, 1912, in the presence of the French Military Committee, composed of General Roques, Colonel Bottieaux, Colonel Estienne and 30 officers (all certificated military pilots) from Vincennes and Chalais-Meudon.

The machine was turned upside down, the body being properly fixed on trestles, and the wings were weighted with 3,250 lbs. of sand, while at the same time a horizontal traction equivalent to 650 lbs. was exercised on both wings. No part of the machine suffered in any way from this experiment. A further 216 lbs. of sand was added to each wing, and they were submitted to the same horizontal traction with again the identical results; the weight was again increased, and several trials made, and it was only under a weight of 5,070 lbs., combined with a horizontal traction equivalent to 780 lbs., that the wings began to give way.

Even then the stays and all attachments as well as the fuselage and pylone were intact.

The Military Committee examined every part of the machine, and after consultation made a report that the whole construction of the machine was perfectly satisfactory, and the 1912 model was adopted for the French Army.

General Joffre, Chief of the French General Staff, has issued from the Ministry of War the regulations dealing with the training of officers as observers in aeroplanes. The instruction of observers will be absolutely distinct from that of pilots, and even from that of balloon observers. They will be trained in camps during the manœuvres and brigade exercises. Officers will be selected for duty as observers, from captains and lieutenants on the Staff, and from captains who have commanded companies for two years. General officers commanding army corps are requested to select from their Staffs and their commands officers suitable for service as observers.

An aviation camp has been formed under the command of Captain Clavenad (promoted from lieutenant for this service) at Fez. He has under him Lieutenant-Aviators Van den Vaero, Trétarre and Do-Hu. His fleet is composed of four Gnôme-Blériots, and he has a Bessoneau portable hangar in which to keep them. Lieutenant Escot has left France for Morocco with two military type Gnôme-Blériots and an automobile. He is accompanied by a section consisting of a sergeant-major, a corporal, and eight men. He and his section will serve under Captain Clavenad and will make aerial journeys over the desert.—W. E. de B. W.

French Naval Aviation.

The cruiser *Foudre* has now been refitted for service as a mother ship for naval aeroplanes, and the Voisin "type canard" hydroaeroplane, ordered some time back, is to be delivered this week. Several experimental machines have also been ordered and will be taken over by the Navy in a few weeks. The estimated expenditure on aviation in the French Navy during 1912 is 1,214,230 francs (about £48,570), whereas only 150,000 francs (£6,000) has so far been granted by Parliament. The difference will be made up by supplementary votes later in the year.

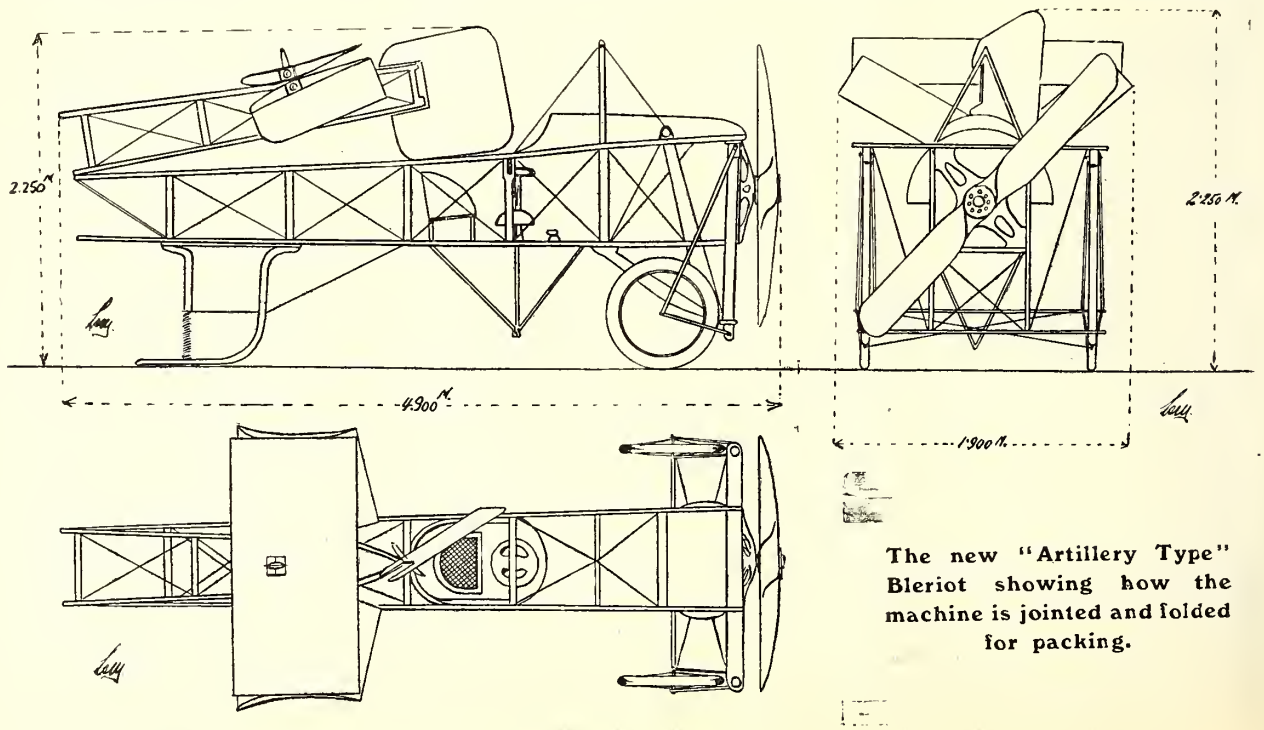
The Minister of Marine has instructed the Naval Prefect of Brest and the Admiral commanding the French Atlantic Fleet to select officers, quartermasters, marines, mechanics and carpenters to serve in the aviation section of the French Navy. Officers only will be trained as pilots.—W. E. de B. W.

Continental Notes.

L'Intransigeant, of Paris, has, it is alleged, offered a prize of 100,000 francs (£4,000) to the winner of the match between the Sommer and Deperdussin firms. There is no news as to whether the match will take place.

At the aerodrome of Etampes, on March 10th, Mlle. Suzanne Bernard, a young aviatrice, was killed whilst flying for her certificate. She had made several flights during the morning, with that recklessness so frequently born of inexperience and lack of fear. She attempted to rise whilst making a turn to the right, lost way, and did a side glide to the ground from a height of 200 ft. Her career as a pupil was brilliant, and she was personally of great popularity at Etampes. Mlle. Bernard was born at Troyes in 1893, and met her death on a Farman biplane.

Mme. Driancourt, an aviatrice of some skill, flying a Caudron biplane at Issy-les-Moulineaux on March 9th, came down from a height of 150 ft. and was slightly injured.



The new "Artillery Type" Bleriot showing how the machine is jointed and folded for packing.

Her husband was killed a short time ago in a motor-car accident.

The subscription raised by *Le Matin* for the presentation of aeroplanes to the French Army, reached, on March 9th, a total of 1,219,639 francs (£48,785 11s.).

M. Paulhan's Curtiss hydro-aeroplane successfully passed the tests imposed by the Military Commission under Lieutenant-Aviator de Goys. Lieutenant-Aviator Lucca, after two flights with M. Paulhan, took the machine up unaccompanied, and made several excellent flights, alighting on and arising from the sea several times with perfect facility. M. Frank Barra, who made his reputation on the Maurice Farman biplane, also made several aerial journeys on the "Triad."

On March 3rd, at Johannisthal, Hoffman, on a Harlan monoplane (100-h.p. Argus engine), beat a passenger-carrying record. He flew from 5.30 p.m. until 6.2 p.m. with four passengers, thus beating the record made by Renzel at Munich, who flew with four passengers for 21 min. 45 secs.

The Swiss Aero Club has notified the Aero Club of America that Audemars will represent Switzerland in the Gordon-Bennett Cup Race.

René Caudron tested his new Caudron hydro-aeroplane fitted with Fabre floats on March 9th in the estuary of the Somme. He made several flights, alighting on the water between each essay. I understand that the experiments were satisfactory.

Just as the spring military review was beginning at Vincennes on the morning of March 10th, Mr. Gordon Bell, on a R.E.P. monoplane, accompanied by two passengers, flew at a great height over the large crowds assembled to watch the troops. His two passengers scattered bouquets of violets, with trailers of tricolour ribbon attached. The military bands played the "Marseillaise," troops saluted, and the multitude was happy.

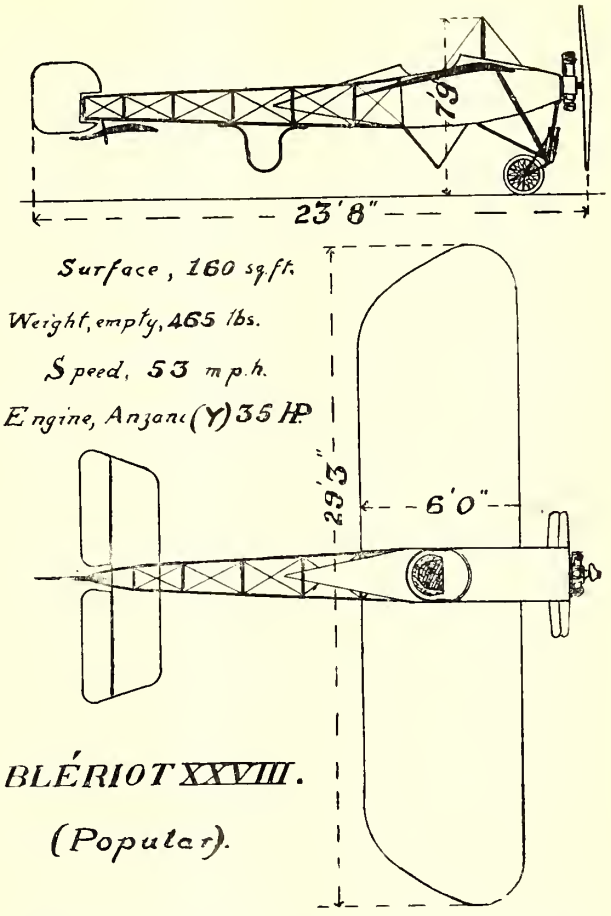
On March 11th M. Maurice Tabuteau succeeded in flying from Pau to Paris in the course of one day. Lieutenant de Conneau and Lieutenant Bellenger have both made this journey, but in each case taking two days. M. Tabuteau left Pau on a 50 h.p.-Gnôme engined Morane-Saulnier at 7.15 a.m., and arrived at Poitiers at 9.25 a.m., where he landed in the Biard Aerodrome. Thus he covered the first 420 kilometres of his flight at an average speed of 163 kilometres an hour. He started from Poitiers at 2.50 p.m. for the last stage of his journey. At Etampes he landed in order to change a plug, remaining on the ground about ten minutes. He finally landed in the Villacoublay Aerodrome at 5.25 p.m., having covered 720 kiometres in 5 h. 10 m. actual flying time. The earlier part of the flight was performed under adverse conditions, the wind being high and rain frequently falling. That such an excellent flight should have been made with a 50 h.p. engine gives excellent promise for the future, and proves the efficiency of the Morane-Saulnier monoplane.

The Monaco hydroaeroplane meeting begins on March 24th and ends on the 31st. The entries are as follows:—1, Paulhan (Curtis biplane); 2, Robinson (Curtis biplane); 3, Colliex (Voisin biplane, "type canard"); 4, Rugère (Voisin biplane, "type canard"); 5, Eugene Renaux (Maurice-Farman biplane); 6, Benoit (Sanchez-Beza biplane); 7, —— (Caudron-Fabre biplane); 8, Taddéoli (Perrot-Duval).

M. Santos Dumont, of whom one has heard little of late, made an ascent on March 2nd from Saint Cloud in a spherical balloon. He landed, after being in the air 1 hour 15 minutes, between Grand-Fresnoy and Arsy.

For many years acute observers have seen signs of the decadence of Parliaments. The composition of such deliberative assemblies has altered. Where unselfish devotion to the country's cause once reigned, self-interest holds the ground. Vulgar abuse and meretricious argument have usurped the place of measured periods and pure logic. But in England at least we have been remarkably free from legislators with the souls of *Apaches*. Few of such have stood as candidates for election to Parliament. France has had a narrow escape during the last week. Védrines, with the supreme insolence of one who has attained a "cabaret" popularity by singular daring as an aviator, has contested the representation of Limoux, as an Independent Socialist, against M. Bonnail, Socialist-Radical. It was for some days feared that Védrines might succeed owing to his great popularity with the lower classes, but M. Bonnail was elected by a majority of 650 votes. And so has the French Chamber of Deputies escaped uninvited trouble.

As a set-off against the fatal accident to Mlle Suzanne Bernard, who was killed when flying an engine-behind biplane with a lifting tail, I was interested to hear from a friend, who is a pupil at the Bréguet School at Douai, that the pupils at that school, depending on the natural stability of their machines and the way the pilot is protected against accident, go out



The new cheap Bleriot for sporting purposes.

cheerfully in all kinds of winds, and get knocked about in a most astonishing manner without serious damage to themselves, though, of course, the machines suffer badly, no less than seventeen machines having been smashed in one way or another in the last seven weeks without the slightest injury to the pilots. When a machine is seen to have damaged itself, the school crews simply get the breakdown gang ready and go out to fetch the wreck; nobody troubles about the pilot, because the machines are known to be so safe that it is long odds against his being damaged even in what looks like a very bad smash. This method may be expensive in machines, but it certainly produces better fliers than sitting still and waiting for a calm before one dare venture out. Pingouin Rose.

The Italians on Active Service.

Signor Mario Arioli, of Cardiff, has recently been in communication with several Italian officers who have been on active service in Tripoli, and wrote to The Aeroplane last week, sending the accompanying photographs of the first air-scouts.

In his letter he says that the Italian officers have found valuable support from the aviators, especially in their ability to notify every movement of the enemy and to warn the Italians of every arrangement made by the Turco-Arabs in their efforts to attack the weak points of the Italian defence. Also the aviators served splendidly in finding the exact position of the enemy's encampments, and so in directing not only the field artillery but also the big naval guns on their works.

The bomb-throwing has been very satisfactory, and the officers are now experimenting with a special instrument for throwing bombs with precision.

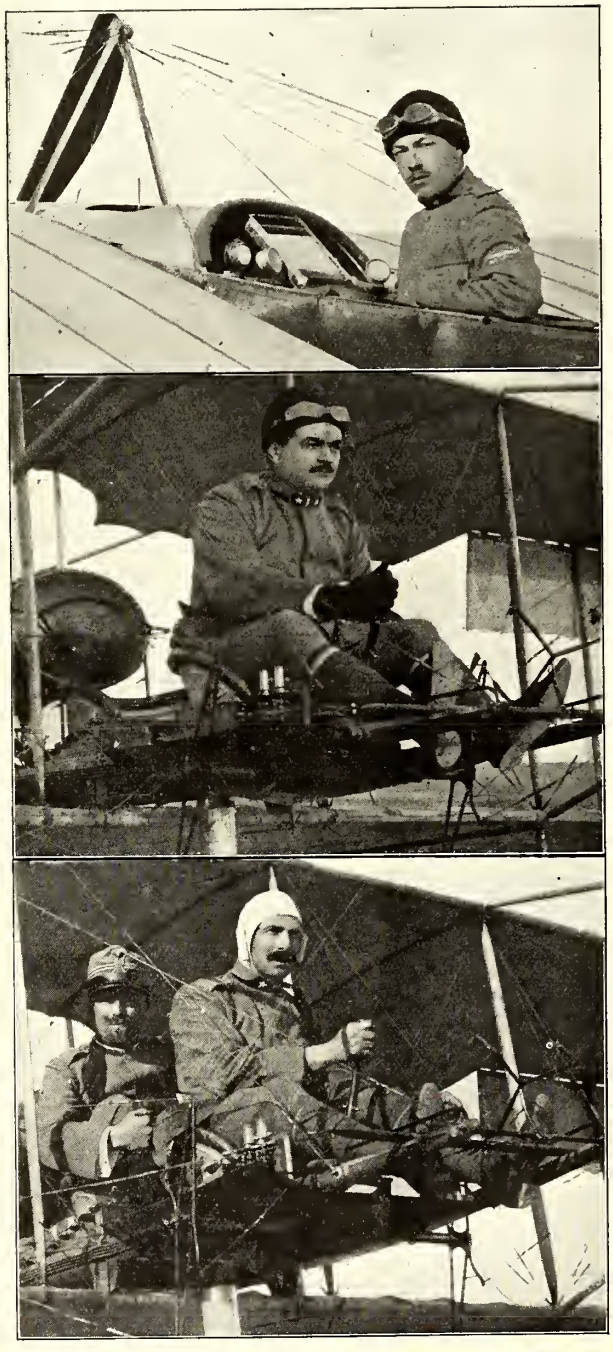
Other officers confirm the same things, only one adds that the fast monoplanes are not so much liked for scouting purposes, as the pilot is too occupied in keeping control of the machine, and his view of the ground is not so good as on a biplane.

From the Italian newspapers one hears that the Italian dirigibles P2 and P3 were out at Tripoli the other day, and

both kept the air for more than two hours. Captain Moiso and Lieut. Gavotti flew a few days ago from Tripoli to Homs, the former coming back to Tripoli with another officer on board.

Captain Piazza on a Nieuport and Lieut. Gavotti on a Farman flew the other night for over an hour. This is the first time that the aeroplanes have been used in the night time.

Writing later, Signor Arioli says that the dirigibles *P.2.* and *P.3.* were out again at Tripoli and had a flight for over two hours. During this time they kept nearly always not very far one from another and flew over the Turks' advanced posts at Fanzur. Notwithstanding that very little news was given to the Press, the Italian papers have been able to gather that this first experiment has been very satisfactory and the officers were able to take exact note of all the positions of the enemy.



The Italian Air Scouts:—Lieut. Romolo Manissero on the Bleriot; Lieut. Giuseppe Rossi: and Lieut. Ruggerone Germano, with Lieut. Ercole Capuzzo as passenger.

The *P.3.* threw several bombs into the Turkish trenches with very good effects, so the *Corriere della Sera* reports.

In another letter he says that the two dirigibles at Tripoli are doing very well. For three consecutive days they were out manœuvring over Tripoli, and on the 10th and 12th inst. they flew for over three hours each day over the enemy's positions. They always kept well over 1,500 metres, and notwithstanding that numerous shots were fired against them none passed near them. Their speed was well over 45 kms. per hour. The *P.3.*, on the 12th, flew over Favia and completely destroyed with five bombs a Turkish encampment. The *P.2.*, instead, threw bombs on a caravan with ammunition and stores, killing several camels and dispersing the rest. During both days they threw about 50 bombs, all with great success.

Writing from Italy, Mr. T. S. Harvey says that the *Corriere della Sera* stated that some of the bombs which the Italian aviators have been trying to use in Tripoli are useless, because, when they drop into the sand, they bury themselves without exploding. Further bomb experiments have recently been tried from dirigibles instead of aeroplanes. Of course, the dirigibles are quite safe, because they have not got any aeroplanes up against them.

The Chiribiri people have, unfortunately, had another death. Braschi, a Florentine pupil, got out of the aerodrome and into a tree at Mirafiori recently. Mr. Harvey also says that there is no sign of work at the Paulhan Company's shops yet.

A Foreign Government and a British Firm.

It is interesting to report that, as the result of the operations of their commission in Madrid, the British and Colonial Aeroplane Company have been favoured with a large order for monoplanes and biplanes by the Spanish War Office. This success is of special significance and importance by reason of the fact that the order was secured against the most severe competition from French constructors, and the order was given only after the most exhaustive flying tests had been made under the observation of the most experienced Spanish officers.

The King of Spain displayed a keen interest in the trials of the Bristol machines, and such well-known Spanish officers as General Marina (Commandant of Madrid), General Echague, Count of Serallo (Commandant of Valencia), Colonel Vives, with many others, showed their confidence in this monoplane by taking long trips as passengers under the pilotage of Messrs. Busteed and Pixton.

The Bristol Company, in addition to supplying all the machines for the Spanish Army Aviation School, have been requested to take over the control of the school, with the complete charge of the training on these machines of their military pilots.

Also, it is practically certain that the Bristol monoplane, consequent on its undoubted excellence as a cross-country machine, will be bought in considerable numbers by the Spanish Army for the operations now taking place in North Africa.

A Slight Anticipation.

It was reported in last week's Aeroplane that on the previous Sunday, M. Jullerot, the chief pilot of the Bristol School on Salisbury Plain, had made that day his 12,053rd flight. Also that Mr. Gordon England had taken the new Bristol biplane of his own design up to 6,000 ft. Both these well-known aviators write to say that there is a slight error in the figures, M. Jullerot having actually made up to that day 1,253 flights without an accident, and Mr. England having taken the new machine, which he was then driving for the second time, up to 600 ft., both being, of course, excellent performances. The error was due entirely to the mistake of a typist, and one can only assume that the splendid performances of these two famous fliers had inspired this particular typist with such admiration for them that he or she, as the case may be, had slipped in the extra nought in each case in a humble effort to increase their already great reputation.

The Royal Aero Club.

The annual general meeting will be held to-day, Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

Control of Competitions.

The Royal Aero Club of the United Kingdom has the sole control of all competitions, sporting events, or trials in connection with aeronautics in the United Kingdom. The exercise

of this control shall be vested in the committee, who may for this purpose from time to time make, alter, or amend such rules and regulations as it may think proper. Any person, whether a member of the club or not, who shall disregard any such rules and regulations, or take part in any competition not authorised by the club, shall be liable to such penalty of suspension or disqualification as the committee may think fit to pronounce. The committee may grant permits for competitions, sporting events, or trials, and may delegate its powers of suspension or disqualification to other clubs or persons with or without appeal to the committee. Powers of temporary suspension may be delegated to any steward or judge appointed for any meeting.

Right of Appeal.—If any person is aggrieved by a sentence of suspension or disqualification under the competition rules, he shall have a right of appeal to the stewards of the Royal Aero Club, who shall give an opportunity to the parties of stating their case and tendering evidence. A sentence pronounced by the stewards of the Royal Aero Club shall be final and without appeal (except in the case of international competitions), and shall be binding on all persons for all purposes. The stewards of the club or the committee may authorise a statement to be inserted in the official organ of its decision under this rule.

Election of Stewards.—There shall not be less than six, nor more than twelve, stewards of the Royal Aero Club, who shall be elected annually in April by the committee of the Royal Aero Club. They must be members of the Royal Aero Club, and must not have any direct financial interest in the aircraft trade.

Proceedings.—The stewards of the Royal Aero Club shall appoint their own chairman and secretary, and fix their own meetings. The quorum shall be three.

By order of the Committee,
Harold E. Perrin, Secretary.

At the committee meeting on the 12th inst. Major A. W. Peck was elected a member.

The following aviators' certificates were granted:—(194) Captain Patrick Hamilton (Deperdussin, Brooklands); (195) Lieutenant Cecil John L'Estrange Malone, R.N. (Short biplane, Eastchurch); (196) Captain George Hebden Raleigh (Bristol biplane, Brooklands); (197) Ronald Louis Charteris (Deperdussin, Brooklands). The request of the Aero Club de France to grant an aviator's certificate to Mr. James Grant was sanctioned.

London to Paris Flight.—The committee unanimously resolved that a letter be sent to Mr. H. Salmet congratulating him on his record non-stop flight from London to Paris.

Regulations for preventing collisions in the air were drawn up, and it is hoped to publish them next week.

Aviation Accidents.—The club has appointed a special committee, with Colonel H. C. L. Holden, C.B., R.A., as chairman, to inquire into the causes of aviation accidents. The Aeronautical Society has accepted the invitation of the club to nominate three representatives to this special committee.

Army and Navy Aviation Prizes (Mortimer Singer).—Intending competitors are again reminded that this competition closes on March 31st, 1912. The best performances so far recorded are as follows:—*Army*—Lieutenant B. H. Barrington-Kennett, 249½ miles; *Navy*—Lieutenant A. M. Longmore, R.N., 180½ miles (this distance is subject to verification).

The Aeronautical Society.

On Wednesday next, the 27th, the annual general meeting of the Aeronautical Society takes place at the Royal United Services Institution. As noted last week, it will then be necessary to elect eight members for the council, half of them being associate-fellows and half of them ordinary members. So many excellent candidates have been put forward that it is a matter of very great difficulty to select the eight best.

One may perhaps venture to suggest that of the associate-fellows the most desirable from all points of view would be Messrs. Manning, Low, Clarke, and Dunne, for all four are not only scientific investigators of the problems of aerodynamics, but they are thoroughly good practical men as well. Some of the other candidates may possibly be more practical than one or two of these four, but, on the other hand, they are probably not so scientific, and, contrariwise, some of the other candidates may be more scientific, but not so practical.

Almost exactly the same arguments apply when it comes to electing the four ordinary members from the sixteen who have been nominated, and the general opinion seems to be that, taking them all round, the four most popularly appreciated nominees would be Major-General Ruck, Lieutenant Gregory, R.N., either Captain Burke or Captain Sykes of the other military candidates, and Mr. Frank McClean. As a matter of fact, practically all the candidates, with two or three exceptions, taking the two sections together, are almost on one level of excellence, so it is exceedingly hard to make any choice.

The first of the weekly informal meetings took place on Monday last, at the society's new offices, 11, Adam Street, Adelphi, and it was then announced that the immediate programme of these meetings is to discuss the good and bad points of the various flying grounds. Maps of the various aerodromes are to be provided, and pilots, or those who are familiar with the grounds, are invited to attend these meetings, and to point out the exact effects of inequalities of the surrounding country on the air conditions of the aerodrome with the wind in different directions and in different states of the atmosphere. The idea is thoroughly excellent, as quite an amount of useful data for the guidance of future aviators can be gathered in this way by tabulating the opinions of the aviators themselves, and it is to be hoped that pilots from the various grounds will make a point of endeavouring to attend these Monday afternoon meetings, as, by doing so, they will be giving very practical assistance to the general stock of knowledge on the behaviour of air under varying circumstances.

Official Notices.

The following committees have been appointed:—Invention Committee (which deals with inventions submitted for the Society's opinion), Mr. T. W. K. Clarke and Mr. B. G. Cooper; Library Committee (which has charge of the Society's Library and records), Mr. H. F. Lloyd and Mr. Harry Turrill; Publications Committee (which controls and organises the Society's publications), Mr. A. E. Berriman, Mr. B. G. Cooper, and Mr. J. H. Ledeboer; Relations Committee (which treats, when occasion arises, with other aeronautical bodies), Mr. A. E. Berriman, Mr. B. G. Cooper, Mr. F. Handley Page, and Major-General R. M. Ruck; representatives on the Royal Aero Club's Committee for the investigation of aeroplane accidents, Mr. A. E. Berriman, Mr. J. H. Ledeboer, and Mr. Mervyn O'Gorman; representatives on the Parliamentary Committee of Aeronautics, Lord Montagu of Beaulieu, Mr. Griffith Brewer, and Mr. J. W. Dunne; representative on H.M. War Office Technical Reserve Committee, Col. J. D. Fullerton, R.E.; Research Committee (which conducts the research work of the Society in all its branches). The composition of the Research Committee will be announced next week.

A meeting of the Society will be held at the Royal Society of Arts, John Street, Adelphi, on Monday, April 15th, at 8.30 p.m., when Mr. T. W. K. Clarke will read a paper on "Automatic Stability."

The next informal meeting will be held on Monday, March 25th, when the subject for discussion will be "The Atmospherical Conditions at Eastchurch Aerodrome."

The Automobile Engineers' Discussion.

A somewhat sparsely attended meeting of the Society of Automobile Engineers was held at the Institute of Mechanical Engineers on the 12th inst. Mr. de Havilland's paper, describing various types of landing chassis, was distributed at the lecture, instead of being read, with the idea that the time of the meeting should be taken up by a discussion on the paper and by a display of cinematograph films by Pathé Frères. The first film, which was given twice, showed the latest Air Corps Factory machine, which is evidently quite a nice piece of work, gets up quickly, and lands nicely, though it strikes one that steering the machine on the ground by means of the tail skid must strain the fuselage very considerably. The discussion itself was distinctly disappointing, as no new ideas were elicited, for one would expect automobile engineers to contribute some knowledge to mere unorganised "stick and string" aeroplane constructors.

Mr. O'Gorman, of the Air Corps Factory, who opened the discussion, said that when he first began to take an interest in aviation, he was chiefly struck by the idea of bumping into or on to anything, at 60 miles an hour, without damage; but it was really more marvellous that a sparrow, at 30 miles an hour, could check himself so as to land on a twig. One feels inclined to disagree with Mr. O'Gorman on this point, because it is more than doubtful whether a sparrow ever reaches a speed of 30 miles an hour, and, if he does, he is certainly flying down wind, and could not possibly land without turning round. Mr. O'Gorman suggested that we should work out some way of twisting the wings of aeroplanes so as to set at right angles to the motion of the

machine, so as to check its speed, an idea which was later controverted by Mr. de Havilland. Concerning Mr. de Havilland's doubts as to the possibility of producing a variable area to vary speed, Mr. O'Gorman thought that in a few years this difficulty would be unimportant. One might alter the effective area simply by altering the angle of the planes. He said that Mr. de Havilland had evolved a landing chassis on the gun recoil principle, which gave a long travel to take up big shocks, besides absorbing surface vibrations.

Mr. Berriman suggested the use of disappearing wheels, so that the skids could be used as brakes on landing.

Mr. S. F. Cody, who was most enthusiastically received, said that he was not a mechanical engineer, but a designer of lifting surfaces. He had never made but one landing chassis, and that had been quite successful for all purposes for which he required it. With this chassis he was prepared to drive over a ditch 6 ft. wide, at a speed of not less than 10 miles an hour, or over a log a foot high, and to demonstrate that while doing so there was no lift on the planes, and the chassis should show that it was carrying a load of at least 1,200 lbs. Certainly he had never seen the chassis lately evolved by the Aircraft Factory crippled at Laffan's Plain. His own troubles in the early days, when he worked for the Government, was that he never had any spare parts. Speaking of chassis in general, one would always have trouble with long grass unless one used big wheels. The Farman type of chassis, he thought, was cumbersome, and the simplest and neatest chassis of all was the Nieuport.

Professor Hele Shaw remarked that he had taken the chair three years ago, before the same society, at a meeting on "Aerial Automobilism," and he thought the progress since was a great credit to the pioneers. No one could have followed Mr. Cody's work, and have noticed the discreditable lack of support from which he suffered, without realising that he was an engineer of the best sort. Mr. Cody's chassis combination of wheels and skids was a proper engineering affair.

Mr. Legros, the chairman, said that the Bréguet shock-absorbers were exactly similar to the stop-buffers at railway terminals.

In a brief reply Mr. de Havilland, who has, at any rate, an excellent practical knowledge of aviation, pointed out that Mr. O'Gorman's notion of twisting wings to stop a machine would be useless in a following wind. He said that the variation of speed of the Army Aircraft Factory machine was from 40 to 56 miles an hour. He also said that in the Bréguet oleo-pneumatic shock-absorbers the oil was free to pass both ways through the valves when the machine was rolling.

It is to be hoped that, next time the Automobile Engineers undertake a debate on practical questions concerned with aviation, they will take the precaution of inviting several really experienced practical men, who would doubtless be able to give them really valuable information.

Aviator-Motorists.

Mr. Conway Jenkins, who last year was flying the Avro very well at Brooklands, where he was the unintentional originator of that useful word "discontinuation" as synonymous with a smash, has arranged to drive one of the Arrol-Johnston cars in the French Grand Prix over the Dieppe Circuit. Mr. Jenkins handles a car very prettily on the road, and ought to put up a good show. Another aviator to turn racing driver is Mr. Harry Ferguson, who is still Ireland's only constructor-aviator. He is to drive one of the Vauxhalls.

Mr. Cody.

Many Happy Returns to Mr. S. F. Cody, who was born, appropriately enough, at Birdville, U.S.A., on March 6th, 1861. He is therefore certainly the oldest aviator in this country, if not in the world, as well as being one of the best. The date of his birthday was only brought up accidentally in the course of a conversation the other day, hence these delayed, but none the less sincere, good wishes.

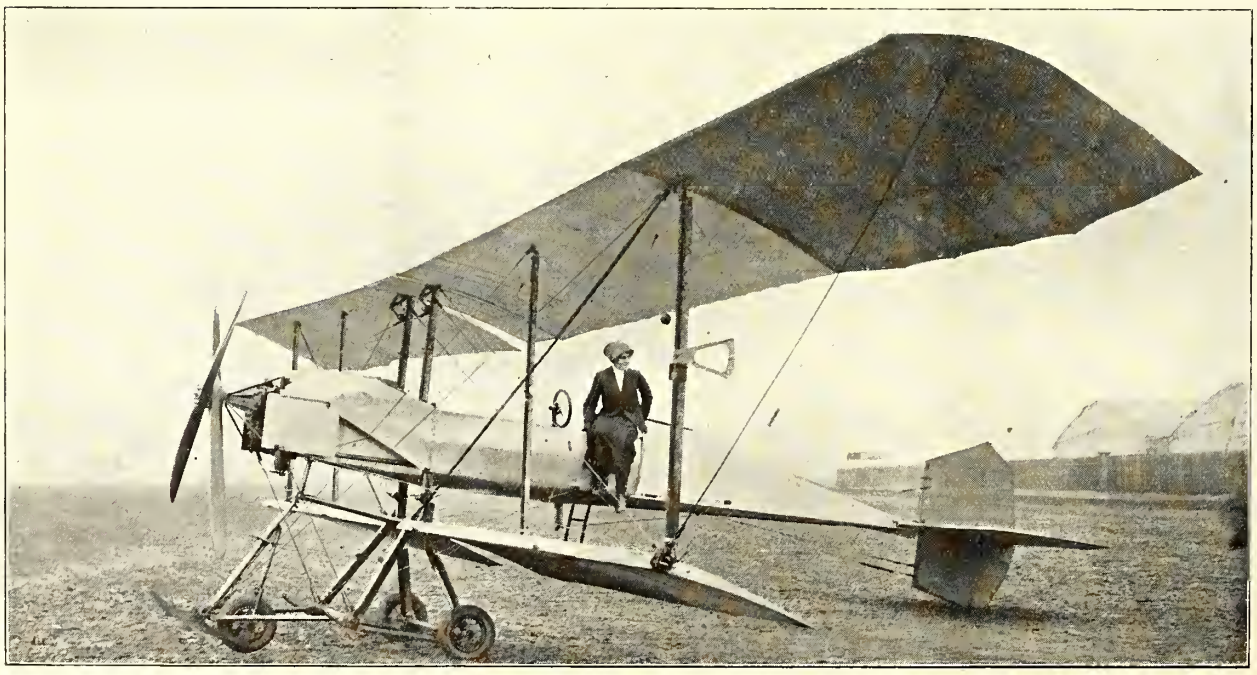
A British Sportswoman.

A fine example of sportsmanship is that of Mrs. Buller, whose husband owns a number of the popular bungalows at Shoreham. When the Comte de Montalent was over here with the Bréguet, Mrs. Buller made several flights with him, and was so taken with the machine that she resolved to learn to fly it. Consequently, as her husband had to make a long business tour abroad, Mrs. Buller shut up her house, packed her two small sons and their nurse into her car and drove across France to Douai, where she has since been flying.

Her apprenticeship was short, for in spite of bad weather she has only been learning seven weeks, and evidently might have taken her certificate some time ago, for last week she made a flight of 100 kilometres across country from Douai to Arras and back, including several detours off the direct route to explore the country. This is certainly the longest cross-country flight ever made by a woman.

Mrs. Buller says that the pupils at Douai have such confidence in the stability of their machines when in the air, and in the way they are protected in case of a smash, that they go out in all sorts of weather.

Soon after her big cross-country flight, Mrs. Buller herself flew into the wash of the Comte de Montalent's machine and came down quite a nasty bump, but absolutely without damage to herself. She is a firm believer in the sense of sitting behind the engine and inside a proper protective body.



Mrs. Buller, of Shoreham, who has recently been doing some fine cross-country flying in France.

The D. G. Gilmour Memorial.

Further satisfactory progress has been made with the D. G. Gilmour Memorial Fund, and the way in which subscriptions continue to come in without direct requests to individuals shows the high esteem in which our dead friend was held. The subscription book opened at Brooklands has been highly successful, for Mrs. Handasyde has already collected £26 5s., and has the signatures of other subscribers to a further £15 or so. Donations large or small towards the fund will be welcomed from those who knew D. G. personally, or who, having only seen his wonderful demonstrations of flying, feel they would like to help in perpetuating the memory of one of the finest fliers we have yet seen, and one of the real pioneers of aviation. Readers of The Aeroplane are reminded that the shillings of the less well-to-do are quite as great a tribute to his memory as are the larger sums of those more blessed with worldly goods, and not the least valued of the subscriptions are the threepences of two Boy Scouts at Brooklands, who show their appreciation of one whom they had admired so often.

The following is the state of the subscription list:—

	£	s.	d.
E. C. Gordon-England	5	5	0
J. Herbert Spottiswoode, Henry Knox, W. B. R. Moorhouse, E. V. Sassoon—£5 each (4) ...	20	0	0
Staplee Firth	3	3	0
The Brothers Pashley, Howard T. Wright, T. O. M. Sopwith, G. M. S., E. W. Edwards, C. G. Grey, C. G. Grey (senior), Fred May—£2 2s. each (8)	16	16	0
E. T. Willows, Harold Perrin, Eric Clift, Frank McClean, Norbert Chéreau, Maurice Ducrocq, N. S. Percival, Ronald Charteris, Lieut. C. G. W. Head, R.N., Lieut. E. G. Bower, R.N., Howard Pixton, R.N. Mess (Eastchurch), Robert Loraine—£1 1s. each (13)	13	13	0
Robert Martin, Giovanni Sabelli, H. Petre, R. W. Gill, Lieut. Wilfred Parke, R.N., Major Sir Alexander Bannerman, R.E.—£1 each (6) ...	6	0	0
Ronald Kemp, P. K. Turner, Seymour Metford—10s. 6d. each (3)	1	11	6
Mrs. Hilda Hewlett, E. V. B. Fisher, L. Howard Flanders, Granville Bradshaw, H. P. Nesham, A. W. Furbank, E. F. Chinnery, Lieut. W. D. Beatty, R.E., Claude Bettington, A. Dukinfield-Jones, E. C. Hammer, C. P. Pizey, H. R. Fleming—10s. each (13)	6	10	0
S. H. Davis, F. R., J. R. D., G. B., E. A. G., H. Blackburn, W. Stanhope Spencer, C. A. H., T. Ingram Walker, P. M., R. P. C., Lucas' Stores, F. Sigrist, J. A. Anderson, A. V. Roe, L. Marcus, M. and H. Staff, Nell and Frank, G. H. A., J. Alcock, Miss Bacon, J. Furley Smith—5s. each (22)	5	10	0
J. H. Brownrigg	0	4	0
E. M. W., W. P., P. R. C. G., W. A. S., C. H. B., G. C. G., F. C. B., F. W. M., L. M., Ch. Pellassy, J. W. Smith, H. T. Lane, S. V. Setti, H. J. Ll., "Darracq," W. G. Aston—2s. 6d. each (16)	2	0	0
W. H. W., T. E. C., B. H. F., P. Hills, G. W., J. M. D., G. A. F., R., S. D.—2s. each (9) ...	0	18	0
H. Dibdin	0	1	6
G. Martin, H. B. T., S. V. B., E. Harman, D. H., A. P. L., A. C. M. P., G. W., T. Lawrence, L. Hook, A. G., S. H., H. B., G. L., F. C., D. W. J. H., C. P., J. S. W., C. V. Moore, E. T. Arnott, T. Skelton, W. Seaborn, A. E. B., A. W. K. L., A. S., D. L. S., A. E. V., W. G. W., A. W., M. C. W., J. J. C., A. W. D., L. Derisley, H. Morrish—1s. each (34) ...	1	14	0
C. J. Johnson, A. Sparrow, A. E. Cartledge, H. B., C. H. D., R. D., B. W., A. J. F., G. H. T., P. H., J. B., A. B., H. O., T. J. F., W. Barnes and A. Francis (two Boy Scouts)—6d. each (15)	0	7	6
Total	£83	13	6

Light Refreshment.

Any aviator, or anyone who knows anything about aviation, can pass a highly entertaining quarter of an hour in reading the article entitled "The Flight of Man," in Part 11 of "Harmsworth's Popular Science." It is almost, if not quite, the funniest thing yet published on the subject. Starting with the imposing heading of "Navies Grappling in the Central Blue," the author goes on to speak of the five-seater monoplane which was shown at the Paris Show, a machine which, so far, has only flown with the pilot alone on board, as

The Bristol in Spain—Mr. Harry Busteed, with Mr. Farnall Thurston as passenger, about to start across country. Mr. Busteed with Captain Kinderlan—chief of the Spanish Air Corps—as passenger. Below is shown how the Bristol stood up to Captain Allen's dive in the sewage farm at Brooklands.

"not an experiment, but a practical commercial touring car bought by one of the leaders of the art of flying." Our excellent friend Henri Deutsch de la Meurthe as a "leader of the art of flying" is quite a pretty conception.

As a sample of aerodynamic knowledge, our author informs the waiting multitude that the aviator's machine "is essentially a glider, and in it he can glide at a speed of 150 miles an hour from the clouds to the field, shutting off his engine and trusting entirely to the management of his two artificial wings."

Talking about the Gnôme engine, the verbal artist says: "Attached to the whirling hub is a propeller, sometimes made of wood and sometimes of metal, and often with two long curved blades like the screw of a steamer." "Often" is precious.

One of his most delightful efforts is the imaginary picture of a fight in the sky between an aeroplane and a dirigible, in which occurs the beautiful phrase: "Our pilot grips the wheel, his feet play on the rudder pedals, and in one long swift dive the flying machine passes over the top of the dirigible balloon and then soars again upwards." The idea of the feet playing on the pedals suggests the horrible idea that our excellent friend Mr. Ewen may have had something to do with this—but perish the thought!

Second Thoughts of an Idle Designer.

By P. K. TURNER.

It is a fact that, to one seriously interested in aviation, the majority of one's thoughts in idle moments bear more or less indirectly upon that subject. Personally, the best and clearest ideas of the day are those which arise after one has retired to rest. Since most of these ideas are short, sweet, and disconnected, it seems that they can best be dealt with by lumping them together under some such title as the above, which in itself implies discontinuity.

Uniform Strength in Construction.

I was recently thinking, after a visit to an aerodrome, about the quality of the constructional design which I had observed there, and it struck me that there is still very much to be done in that particular direction. Most people know more or less well the poem of "The One Hoss Shay," which was so designed, every part of it being of exact proportional strength and lasting power, that it ran for exactly one hundred years, doing its stated performance every day without trouble of any kind; but when on the following day an attempt was made to perform the usual, everything broke simultaneously, the total effect being similar to that which is observed after an atterrissage by one or two of our aviators who shall be nameless.

It should be obvious to any aeroplane designer that this is distinctly an ideal to be attained, not, perhaps, as regards lasting power, but certainly as regards strength. Uniformity of strength is a thing which is worshipped by those who profess most branches of engineering; but it is lamentably neglected in aviation, where it is the most important, for obviously the strength of an aeroplane as a whole is no greater than the strength of its weakest portion, and a greater factor of safety in other parts is not only perfectly useless, but even positively harmful, since, owing to their additional strength, they must be of unnecessary weight, and are therefore inefficient.

To obtain an efficient machine, then, it is obvious that the factor of safety must be the same throughout when the machine is flying. But it must be noted that it may be advisable to imbue the chassis with a higher factor, since, when it is used, the machine is more or less free from normal strain, so that the factor of safety of the chassis may be considered as distinct from that of the rest of the machine.

The Elastic Limit.

As regards the choice of material for aeroplane construction, we often hear from such and such a constructor that his machine has a factor of safety of, say, 10, and that such and such another machine has a factor of safety of only 7; yet it is quite within the bounds of possibility that the second machine may be in actual practice safer than the first, even supposing their design identical. This is because the safety of the machine does not depend entirely on the final fracture of the material. It is well known to engineers that, as the strain on a sample of material is increased, a point known as the elastic limit is reached, beyond which it is not wise to strain it, since, if the strain *is* carried beyond this point, what is known as a "permanent set" is caused, and the material is weakened.

This elastic limit is, of course, always less than the actual breaking strain of the material; but the proportion between the two varies enormously with different materials, and, since the ultimate usefulness of any given material depends on the elastic limit, we see that, if the man whose machine had a factor of safety of 7 used more elastic materials than he whose factor of safety was 10, it is possible that the real safety of his machine might be as great as that of the one more heavily built, owing to the difference between their respective elastic limits.

Resiliency.

Another point in construction is the difference in resiliency of various materials. For example, the strength of Honduras mahogany is greater in compression than that of ash, but the resiliency of ash is greater than that of mahogany; that is to say, that a given ash spar will absorb a greater amount of energy than a similar mahogany spar without collapsing. Now, if used in calm air, the mahogany machine can obviously be built lighter than the machine of ash for the same strength; but, since allowance must always be made for irregular air velocity and for shocks in landing, for practical purposes an ash machine would probably be stronger than a mahogany machine of the same weight. As a matter of fact, a compromise is usually made by building of ash, hickory, or other resilient timber such portions of the machine as are particularly liable to shock, mahogany being used where the strains are fairly even.

The best Air Speed.

Now that an aeroplane is capable of flying at speeds varying between fairly wide margins, it is worth while to examine the conditions, so as to find out what speeds take a minimum thrust or power. For this purpose it is necessary, of course, to note what relation the thrust has to the speed of a given machine. Now, when one speaks of a given machine, one means that its lifting efficiency, its weight, and its surface are constant, and it is quite easy to see that in this case the thrust may be divided into two parts, the "drift" and the "head resistance," and that, while the latter increases with the square of the speed, the former *decreases* as the square of the speed *increases*. Now, those who have any acquaintance with the differential theorem will know that, to find the minimum of thrust, all that is necessary is to express this thrust in terms of the velocity, find its differential coefficient, and equate it to zero, when the solution of the equation will give the velocity for minimum thrust. On doing this, we find that the thrust is a minimum when the lifting resistance or "drift" of the machine is equal to its head resistance.

The power used is equal to the product of the thrust and the speed, and on working this out in the same way as the thrust we find that the power used is a minimum when the head resistance is one-third of the drift.

This has a very important bearing on competition flying. For example, if it is desired to remain in the air as long as possible, we have to exert the minimum horse-power during the time the fuel will last, for the total fuel consumption varies with the power multiplied by the time. It will therefore be advisable to fly at a comparatively low speed, so that the head resistance is equal to one-third of the drift, and the horse-power is a minimum. If, on the other hand, it is desired to cover the maximum distance, then the fuel consumed depends on the thrust multiplied by the distance, and it is therefore necessary that the thrust should be a minimum instead of the horse-power; so that in this case the flying would be done at a higher speed, at which the head resistance would equal the drift.

So that we see that distance competitions should always be flown at a much greater speed than duration contests.

An Automatic Elevator.

In connection with the close attention that is at present paid to efficiency of control, it is interesting to note that one of the most powerful forms of control which can be designed is one which is entirely independent of the pilot. This consists in a front elevator which is pivoted about its centre of pressure, and is quite unconnected with any form of control by the pilot himself. This might appear at first to be useless. Let us, however, consider it seriously.

Take first the case of an ordinary front elevator machine. We will suppose that the main plane is of 200 sq. ft., and is set at 1 in 5, while the elevator is of 40 sq. ft., set at 1 to 4, and that they are 20 ft. apart. Their relative lifts will be as 4 to 1, and the centre of pressure of the machine will be 4 ft. ahead of the centre of pressure of the main plane. Now, suppose that the whole machine is tilted downwards through an angle of 1 in 20. The main plane will now be at 3 in 20, and the front plane at 1 in 5. Their relative lifts will be as 30 to 8, and the centre of pressure will advance 2 in. approximately. Similarly, if the machine is tilted upwards through 1 in 20, the centre of pressure will recede about 2 in. Now, suppose that this machine is fitted with a front elevator which is pivoted about at such a point in its chord that it invariably remains at an angle of 1 in 4. In this case, if the whole machine is tilted downwards through 1 in 20, the centre of pressure will advance about 1 ft, and, if tilted upwards through 1 in 20, the centre of pressure will recede 8 in. From this we see that the stabilising moments of the machine with the loose elevator are from 4 to 6 times as great as those of that with the ordinary elevator.

Whether such a machine will ever come to pass is beyond my knowledge, but it would certainly make an interesting experiment. It is quite possible that these considerations may have some bearing on the fact that Mr. Barber's Valkyrie flies just as well when the pilot is not touching the controls.

Lieut. H. H. Harford, R.F.A., in India.

His many friends among aviators will much regret to hear of the accident to Lieut. H. H. Harford, R.F.A., at Peshawur lately. We know that fortunately Mr. Harford escaped with a broken leg, but further particulars are awaited of the cause of the accident. At present one can only wish him a very complete and quick recovery.

Strangely enough, on the very day that the news of Mr. Harford's accident arrived, the first news was received of the work he had been doing in India. Soon after his arrival there Mr. Harford's battery was ordered up to the Artillery Practice Camp at Kotri, near Hyderabad, and the G.O.C. Quetta Division asked that the machine should be brought up for experimental purposes. It arrived at Bombay, and was forwarded thence direct to Kotri, after duty had been paid on it as a piece of ordinary merchandise, which makes one wonder whether British war material going into India is generally charged as dutiable.

It took a whole day to get the machine in its crates up to the camp from the railway, and it was there housed in a sort of shelter made of long poles and cloth, with no roof and a sand floor. The Aeroplane correspondent sending the news says that as soon as the crates were opened they got full of sand; then the wind blew and made it worse still.

Mr. Harford himself put the machine together, assisted only by a gunner, and it took a fortnight to get the work done, owing to the fact that his regular duties kept him busy till about 5 p.m., and he could only work on the machine after that hour. While the work was in progress train-loads of natives used to come every day and sit looking at the thing, and asking questions such as, "Please to tell me when the steamship will fly."

When the machine was put together Major Benwell, of the Scind Horse, who was a fellow-pupil of Mr. Harford's at the Bristol-Brooklands School came down from Peshawur and helped to tune the machine up. When everything was almost ready it rained—the only day's rain in the year—and it rained all day without stopping. Several tents were washed away, and Major Benwell and Mr. Harford spent their time pegging the machine down and slacking off wires.

Next day the trailing edge of one plane had a kink in it, and the tail booms were bent in all directions, so that no amount of experimenting with wires would straighten them. However, after they had been as nearly righted as possible Mr. Harford made his first attempt.

The starting ground was about 700 yards long and 50 ft. broad, after all the large stones had been swept away. The country round Kotri consists of small iron-stone hills with tracts of sand between them. There are no trees to hit, but on the other hand there is no grass on which to land.

Mr. Harford's first attempt was a straight flight up and down his 700-yard track, and on his return the people jeered at the machine and said of course a great thing like that could not fly. However, having got the feel of the machine, he turned round and really let her go.

She lifted quite well, and he went off over the surrounding country for about eight miles, finally landing about 20 yards from his shelter. The crowd were astonished almost out of their wits. "Same like god," seemed to be the opinion of the natives. Whenever the propeller started there was, of course, a whirlwind of dust about a quarter of a mile long, and the natives in the stream used to run for their lives.

The Official Observation Test.

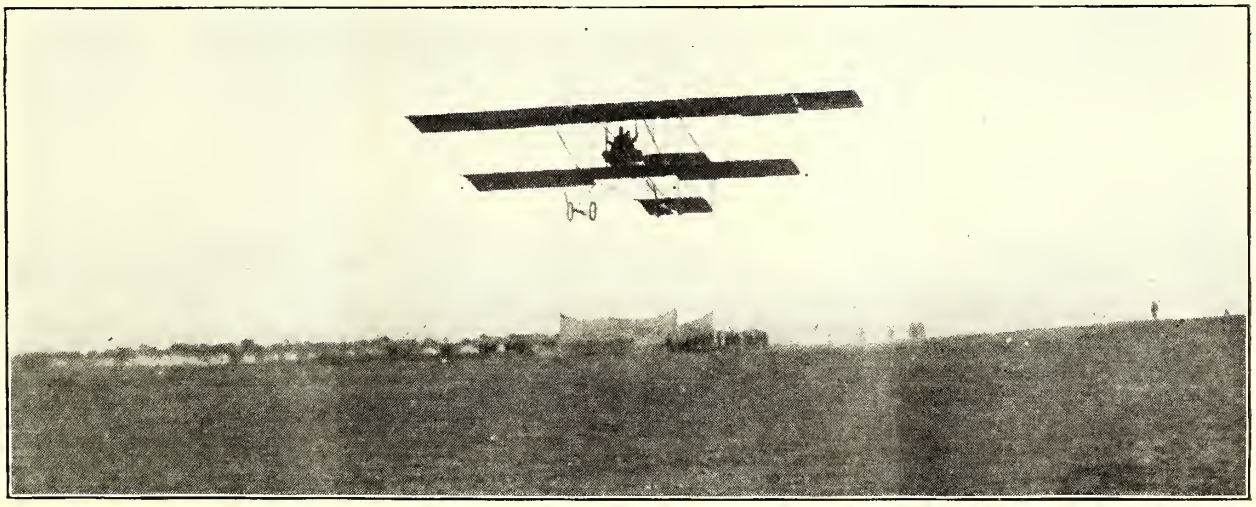
The morning after the first attempt a proper experiment in tactical scouting was organised under the eye of the G.O.C.; targets representing the enemy. Mr. Harford again piloted the machine, accompanied by another subaltern as observer, the passenger drawing a map and putting in the positions of the enemy perfectly. It is worthy of note that this was Mr. Harford's first experience of carrying a passenger, and as there was no landing place anywhere within miles it was certainly a brave undertaking. Under any other circumstances it would have been foolish, but in this case it was necessary to convince the local authorities of the efficiency of the aeroplane, so the risk was justifiable.

The most distant point reached was about eleven miles away, and coming back there was a 12-mile wind behind, so that the speed was fairly high. Just as they got back to camp the Gnôme started missing, and they were forced to come down. The engine stopped absolutely about 20 ft. from the ground, and the machine landed in a small nullah, breaking two struts and a couple of aluminium sockets. Owing to the wind the machine was drifting sideways, and there was no room to land if they had turned to face the wind.

The experience was regarded as highly satisfactory by the authorities, and may have quite far-reaching effects. Later in the day of the accident new ash struts were made, and the railway people cast new sockets of brass on the spot. Apparently any spares that were sent with the machine had got lost on the way. Consequently everything had to be done locally, for there was not even a spare wire strainer. Even the spanners to fit the various nuts had to be made in camp, and a man had to be sent a hundred miles down to Karachi for various odds and ends, so that the fact of the show not having proved a fiasco is all the more credit to Mr. Harford and Major Benwell.

The day after the repairs were effected the machine was taken down and put on truck, the G.O.C. Peshawur District having wired for the machine to go up to manœuvres there. Quite a number of officers in the Peshawur District are already pilots, among them being Major Cooke, Capt. Harrison, and Capt. Richie. Further news of Mr. Harford's accident and of his progress is anxiously awaited.

It should be noted to Mr. Harford's credit that he is the first British officer to fly officially in India. Capt. Dawes made some short flights on a monoplane at the Allahabad Exhibition, but to Mr. Harford belongs the honour of being the first officer to fly on duty.



Lieut. H. H. Harford, R.F.A., starting for the first military flight with an observer ever made in India.

The Week's Work.

Monday, March 11th.

Brooklands.—At Deperdussin School, Mr. "Partridge," now as fully fledged pilot Mr. Ronald Louis Charteris, passed for certificate on racer. Flying very well and up at 300 ft. most of time, landings and glides excellent. Later, Signor Sabelli on brevêt machine for several circuits.

At Flanders School, Messrs. Furbank and Manning doing straights, Mr. Fisher doing circuits.

At Bristol School, Mr. Fleming testing air on monoplane, Mr. Lane then doing straights on same. Mr. Fleming testing new biplane with Mr. Lang as passenger. Mr. Merriam then took up Mr. Fleming as passenger several circuits at 600 ft. In the evening Mr. Lane out on monoplane again.

Air Battalion (The Plain).—Lieuts. Conner and Reynolds early out on *F.4.* and *F.5.*, with passengers observing. These two officers working until lunch. Later Capt. Fulton out on *F.4.*, followed by Lieut. Conner on same machine. Lieut. Hynes passenger carrying on *B.3.*, and Lieut. Barrington-Kennett same on *B.4.* Capt. Fulton went for long trip over Plain, and on landing slightly damaged undercarriage of *F.4.*

The Plain.—After M. Jullerot had made trial, followed by Mr. Gordon England, school work started in usual Bristol fashion. M. Jullerot gave 12 tuition flights, whilst Mr. Gordon England took Lieuts. Fielding, Ercole and Antoni. M. Jullerot also took Lieut. Hall, of Cavalry School, and two other officers, all likely to become pupils. The nurse attending Captain Gilbert de Winckels, who is making excellent progress, was taken for flight by M. Jullerot.

Hendon.—At Grahame-White School, Mr. Lewis Turner up on biplane *No. 2* for quarter of an hour, quickly followed by Mr. Fowler on same machine, who did 20 minutes circuits at 100 ft., finishing with excellent spiral glide. Mr. Biard out on biplane *No. 3* for quarter of an hour. Mr. Manton also out rolling on biplane *No. 4*, and making excellent straights.

All forenoon, weather being favourable, W. H. Ewen pupils got in great practice. In afternoon wind sprang up, but Mr. Ewen tried air and had rather a rocky journey. Captain Loraine soon after took over 28-Deperdussin and made a splendid flight in 10-15 mile wind.

At Blériot School Messrs. Pothet and Clappen put in good practice in straight lines.

Tuesday, March 12th.

Brooklands.—At Deperdussin School, Mr. Gill doing straights, unfortunately landed on propeller, but did no other damage. Out again in evening. Mr. Petre and Signor Sabelli also out doing circuits in afternoon, and Mr. Chinnery doing improving straights in evening.

At Sopwith School, Mr. Sopwith out giving trial flights in nasty wind to prospective pupils.

At Flanders School Mr. Kemp testing new propeller, later flying better with old one. Mr. Manning doing good straights, but discontinued owing to magneto trouble. Mr. Furbank also out. Mr. Manning later breaking own altitude record by reaching some 15 ft. Mr. Fisher out in dusk for several circuits, machine climbing rapidly.

At Bristol School, Mr. Fleming testing monoplane, and in evening Mr. Lane flying good straights on same. Mr. Pizey testing biplane and later giving lessons to Major Sir Alexander Bannerman, Bart., R.E., latter then doing excellent straight flights alone, landing well and handling machine neatly.

Air Battalion (The Plain).—Thick mist all morning, but cleared up at lunch, and all machines soon out. Capt. Fulton scouting on *F.4.* *B.4.* being temporarily out of action, owing to slight damage to wing, Lieut. Barrington-Kennett took *F.5.* for 20-mins. trip, followed by Lieut. Reynolds on same machine passenger carrying. Lieut. Conner then took over *F.4.*

Hendon.—Mist cleared in afternoon, when Miss Dorothy E. Prentice and Mr. Denys Ware got in some useful practice rolling. Messrs. Dubois, Baumann and Warren making splendid flights on Blériot, and well within reach of brevêt. Mr. Ewen and Captain Loraine then decided to go for first part of superior brevêt, but starting off on 28-Deperdussin and rising over 500 ft., Mr. Ewen found wind troublesome, while it was difficult to see ground through mist. Captain Loraine then made beautiful flight on same machine, reaching 600 ft. He went up again later, flying fully half an hour at over 500 ft., passing round Millhill and Edgware, and, still retaining his height, on returning to aerodrome finished with excellent spiral *vol plané*. Between Captain Loraine's flights, Mr. Ewen made short flights of 20 minutes over surrounding country, finishing with effective and well-judged long glides from 500 ft.

At Grahame-White School much flying, which was opened by Mr. Lewis Turner on monoplane *No. 4*, doing straight flights for instruction of Mr. Ramsay, who followed with rolling and short straight. Meanwhile Mr. Biard out on biplane *No. 3*, making straight flights and circuits, as also Major Liles. Mr. Manton and Mr. Raphaite out rolling on same machine, but during latter's practice internal engine trouble developed, and machine had to be abandoned on far side of ground, and towed home later by Mr. W. Lewis Turner on biplane *No. 2*. During afternoon Mr. T. O. M. Sopwith visited school and flew several circuits on old school 'bus, afterwards taking up mechanic Carr as passenger and going to assistance of Mr. Raphaite, previous to latter's machine being towed home. Mr. Fowler also out on biplane *No. 2*, making circuits at 600 ft. and flying well, followed by Mr. Biard on same machine, and then Mr. Lewis Turner.

At A.S.L. School Mr. Ridley Prentice took out school machine for trial flight. Mr. Greig then did some improved rolling. Mr. Barber flew same machine and later took out Gnôme racer, and gave passenger flight to Mr. G. D. Ferguson. In afternoon Mr. Greig showed good progress, and made several excellent straight flights. Mr. Barber busy carrying passengers, and also put up fine exhibition flight.

Hendon.—At Blériot School pupils out in full force, Messrs. Morris, Hall, Pothet and Clappen putting 25 rolls.

The Plain.—M. Jullerot and Mr. Gordon England testing.

Wednesday, March 13th.

Brooklands.—At Deperdussin School, Signor Sabelli on brevêt machine doing circuits, and Mr. Chinnery straights.

At Bristol School, Mr. Pizey testing just before dusk. Then Mr. Nesham flying well for 20 minutes. Very windy.

Hendon.—Messrs. Pothet and Clappen working very keenly, doing straights as long as weather permitted.

At Grahame-White School Mr. Grahame-White out on new biplane for test after alterations to ailerons, which were found inefficient on first trial, but still needing further adjustment.

Liverpool Aviation School.—Mr. Melly had out Blériot-Anzani, and after testing new release, just fitted, sailed straight away in direction of Crosby, flying low, turning after about a mile and flying nearly to Seaforth. Returning he described part of circle and finished up with neat *vol plané* from about 100 ft. in front of hangars. Then Mr. Hardman went out on same machine, and did some pretty hopping, landing quite easily each time.

The Plain.—32 flights at Bristol School. Mr. Gordon England up 7 times with passengers. Messrs. Bendall and Harrison 5 flights each. Commander Schwann solos, Lieut. Brodigan 3 flights. Lieut. Wyness-Stuart on monoplane.

Thursday, March 14th.

Brooklands.—At Deperdussin School, in morning Mr. Chinnery doing curves, and Mr. Petre a circuit.

At Avro School, Lieut. Parke, R.N., testing new 60-h.p. E.N.V.-Avro for Mortimer-Singer Prize for first time. Machine lifted at once at 950 revs. Under-carriage tested in approved style in various straight flights. In evening further tests, machine handling very well, and apparently doing over 60 m.p.h., with two blades of the four-blade propeller originally intended Unseen defect in oxy-acetylene welding of chassis let machine down on wing-tip, but no damage done. School now in charge of Mr. Montague Chambers, formerly pilot of Valkyrie. School machine in running order, so all likely to be busy, especially when military machines are ready for test.

At Bristol School, Mr. Fleming out testing, but too windy for pupils.

Air Battalion (The Plain).—Wind and rain, but plenty of work going on in sheds. *B.4.*'s wing being repaired, and other machines being overhauled, etc.

Liverpool Aviation School.—Mr. Melly took out Blériot-Anzani again with intention of trying some banking, but at end of first trip gudgeon pin broke, wrecking one cylinder and two connecting rods. Fortunately he was able to plane down in time and effected perfect landing.

The Plain.—M. Jullerot and Mr. England testing with Lieuts. Fielding and Ercole as passengers. M. Jullerot afterwards with Capt. Campania.

Friday, March 15th.

Brooklands.—At Deperdussin School, Mr. Petre testing new propeller on racer, but remous too bad.

At Sopwith School, Mr. Young, a new pupil, up with Mr. Raynham for tuition on dual control Wright.

At Flanders School, Mr. Kemp out in bad wind.
At Bristol School, pilots testing.

Air Battalion (The Plain).—Very wet in morning, but at 10.30 a.m. *F.4.* taken out by Capt. Loraine for couple of trips lasting 15 and 20 mins. Lieut. Reynolds also up for half an hour on *F.5.*, but work brought to abrupt conclusion.

Saturday, March 16th.

Brooklands.—At Deperdussin School, Mr. Chinnery, improving rapidly with regular practice, made several half turns, and then a capital circuit. Mr. Gill followed with half turns. Signor Sabelli and Mr. Petre for several circuits on racer.

At Sopwith School, Mr. Young upon Wright with Mr. Raynham. Several new pupils in negotiation, as variety of experience to be gained from different types appeals to those who contemplate taking up serious flying. Some interesting ex-Sopwith has views on hydro-aeroplanes.
periments may be expected shortly from this school, as Mr.

At Flanders School, Mr. Fisher out testing and getting up very quickly; in his own words, "machine going quite comfy." Mr. Furbank doing good straights for 20 minutes. Mr. Manning then in charge, and, in picturesque phrase of local reporter, "made a masterly attempt at a partial turn," landing excellently. Mr. Furbank then out again, and on landing at end of ground bounced up some 10 feet and came down heavily on nose of machine, being thrown out on face and stunned. On being taken to hospital unconscious, doctors diagnosed rather severe concussion, which, however, is not considered serious. Machine turned completely upside down, but pilot's and passenger's seat, wings and wheels undamaged. Fuselage and skid, with engine-bearers and front of fuselage, badly broken. Mr. Furbank carried to hospital shed on bad hand-stretcher and had to wait an hour for a doctor. Hospital shed had to be broken open with pick-axe for lack of a key. Later transported to Weybridge on solid-tyred motor lorry, which stuck on hill. Evident need for proper pneumatic-tyred ambulance-stretcher, and ready access to hospital-shed. Also for a few lessons or lectures on "first aid" to permanent population of Brooklands, as first impulse of well-meaning helpers was to dose patient with brandy.

At Bristol School, Messrs. Pizey and Fleming out with pupils. Then Major Sir Alexander Bannerman, Bart., R.E., out alone, flying nicely. Landed well and got out of machine. Apparently Gnôme back-fired at moment of landing and flash set light to lower plane, for happening to look back while walking to sheds Major Bannerman saw machine well alight. Promptly returned and sacrificed favourite overcoat in beating out flames, so saving old *No. 7*, the favourite school box-kite on which so many brevêts have been taken. Fortunately, only damage was destruction of fabric, woodwork not injured.

Air Battalion (The Plain).—Lovely morning, and Capt. Loraine up for several trips on *F.4.* at very early hour, accompanied by Lieut. Reynolds on *F.5.* Capt. Loraine did height and landing tests for his superior "ticket," and handed over machine to Lieut. Conner, who was up for 30 mins. Meanwhile Lieut. Reynolds out testing new Bristol monoplane (*B.5.*), and made several good flights on it, machine flying very well and fast. After trip by Capt. Loraine on *F.4.* and one by Lieut. Barrington-Kennett on *F.5.* at 10.30 a.m., wind put a stop to further work.

Hendon.—At Grahame-White School Mr. Lewis Turner out on No. 2 in morning, although wind was rather gusty and flying not too pleasant. Mr. Grahame-White out on the same machine in the afternoon, giving some fine exhibition flying out round Edgware Road and Hendon, in very nasty wind. Finished by coming straight across aerodrome, heading up Collindale Avenue, and when over sheds switched off, did a hair-pin turn in the middle of his glide, and came in over the sheds with the wind behind; a really beautiful piece of flying. He was followed by Mr. Lewis Turner, who flew several circuits.

At Blériot School Mr. Allen, who took certificate little while back, came down to inspect trials of a 50-h.p. Gnôme Blériot which he has ordered, and about 5 p.m. M. Salmet, chief instructor of school and hero of London-Paris-London flight of preceding week, took machine out for trials, doing three or four circuits clockwise, which M. Salmet appears to favour.

The Plain.—Mr. Gordon England was out early with Lieut. Ercole, afterwards with Lieut. Hall. M. Jullerot with Lieut. Marshall, Mr. Bendall with Lieut. Fielding. M. Prier on monoplane, with Lieut. Antoni, 2,000 ft. Later M. Jullerot giving tuition. Commander Schwann, also Lieut. Brodigan, Lieut. Wyness-Stuart and Lieut. Head, R.N., on monoplane. Lieut. Bower, R.N., and Mr. Hotchkiss.

Sunday, March 17th.

Everywhere weather hopeless. Wind and wet.

CLUB NOTICES.

Yorkshire Aero Club.—Mr. Stuart A. Hirst, chairman of club, lectured, Tuesday, March 12th, on "The Political Aspect of Aviation." After contrasting air corps of Germany, France, and Great Britain, Mr. Hirst commented on parsimony shown by Government in purchase of aeroplanes, and regretted that what orders were placed were sent to France. With Government encouragement British aeroplane builders could turn out as excellent machines as those made by the foreigners. In discussion it was suggested to arouse greater interest in aviation by lectures and demonstrations. Attendance encouraging, including over a score members of very active model section.—Mr. Herbert E. Harwood, Hon. Sec., *Yorkshire Post* Chambers, Leeds.

Reigate, Redhill and District Aero Club.—Wednesday, Messrs. Lewis, Norton, Osborne and Cox out with models. Saturday, H. Sutton, May, and Lewis. Sutton and May took their 3rd class certificates. On Monday last Messrs. Lewis and Norton out with Lewis's 6ft. glider. Glides of over 1 mile from Reigate Hills. Flying on Saturday next at Earlswood.—H. V. May, Hon. Sec.

Ealing and District Aero Club.—Messrs. L. Roche, C. Chilcott, S. Bostock, C. Roche, L. Kirchner, M. Reed, G. Beeching, G. Condon, J. Pratt, D. Butler and B. J. Kirchner flew eliminating trials for Paddington contest on Saturday. L. Roche had 15 durations of over 25 secs. Chilcott, Bostock, Beeching, C. Roche and L. Kirchner all had good durations, last testing new rook-wing plane. Sunday, Messrs. C. Davies, L. Kirchner testing. New members:—Messrs. A. Haulbery, Margetson, and Master W. Ankatell (aged 10). Flying next Saturday usual place, 2.30 p.m.—B. J. Kirchner, Hon. Sec.

Aero Models Association (N. Branch).—Saturday, 16th, distance event for "Mann" set of parts, at Finchley. A. Houlberg, 1st; R. L. Rogers, 2nd. H. E. Fletcher, A. O. Rogers, H. D. Murray, A. D. Trollope, E. R. Brown, H. Lingard, R. G. Corder, G. O. Partridge, O. W. Root, W. P. Hawgood and F. S. Hindsley also flying. Inter-club match, April 6th, at Finchley, v. Palmer's Green; later, at Ealing, v. Ealing and District Ae.C. Flying next Saturday, Finchley.—M. B. Ross, 15, Highgate Avenue, Highgate, N.

St. Mary's Model Aero Club, Portsmouth.—On Saturday, Messrs. V. L. Addison, Robins, Hoswell, Eburne, Byerley, S. Webb, and Harper made flights.

Hackney and District Aero Club.—Saturday, P. Gittus won competition, presented with carved propeller. Marnin, Hill and P. Hurlin flying. L.C.C. rules for flying on Mill Fields are:—Weight restricted to 4 lbs. and under; no flying after 10 a.m.—Bruce D. Longstaffe, Hon. Sec., 47, Jenner Street, Stoke Newington, N.

Birmingham Aero Club.—Members are visiting Coventry Aeroplane Buildings Society Easter Monday for model contest. Mr. G. Wilde and E. Trykle flying.—G. Haddon Wood, Joint Hon. Sec., 8, Frederick Road, Edgbaston.

Brighton and District Aero Model Club.—Competition for Mr. Townsend's prizes open till end of Easter school vacations. Members are reminded of this evening's meeting (21st).

Paddington and Districts Aero Club (1910).—Parkside, Sudbury, Saturday, Messrs. Chalfont, Hurlin, Weston, Woolley, Carter, Lane, Davidson, Holden, Jackson, C. Levy, M. Levy and Evans flying. Contest with Ealing and Districts Club 4 p.m., Saturday.—W. E. Evans, Hon. Sec., 133, Buchanan Gardens, College Park, Harlesden, N.W.

Bristol Model Flying.—Meeting will be held Sea Walls, 3 p.m., March 23rd. All invited.—R. V. Tivy, Hon. Sec., 3, Royal York Crescent, Clifton, Bristol.

Stony Stratford and District Kite and Model Aeroplane Club.—General meeting held Thursday, March 14th, at club-room. Club elected Mr. C. L. Matson chairman. Mr. O. Hamilton, Junr., read paper entitled "Observation."—O. Hamilton, Junr., Old Stratford, Stony Stratford.

Manchester Model Aero Club.—Opening flying meeting, Aerodrome, Trafford Park, April 20th, at 2.30. Competition will be held and cash prizes offered. Competition decided by formula:—Total weight in ounces, by distance flown in feet, weight of rubber used.—Alan F. Jones, Kenmure Kinna, Joint Secs., 40, Bignor Street, Cheetham.

Blackheath Aero Club.—Kidbrook: Messrs. Brown, Plummer, A. B. Clark, Bailey, Woollard, Morris, Holland, F. Jarvis, Hoch, Peter, Pizey, and Egelstaff flying. Lee: Messrs. Bailey, Whitworth and Dollittle flying. Mr. A. B. Clark flying at Crofton Park. Next week-end flying Kidbrook, Lee, Grove Park, Crofton Park and Blackheath. Particulars of membership from A. E. Woollard, Hon. Sec., 48, Hafton Road, Catford, S.E.

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1D WEEKLY

Edited by CHAS. G. GREY. ("Aero Amateur")

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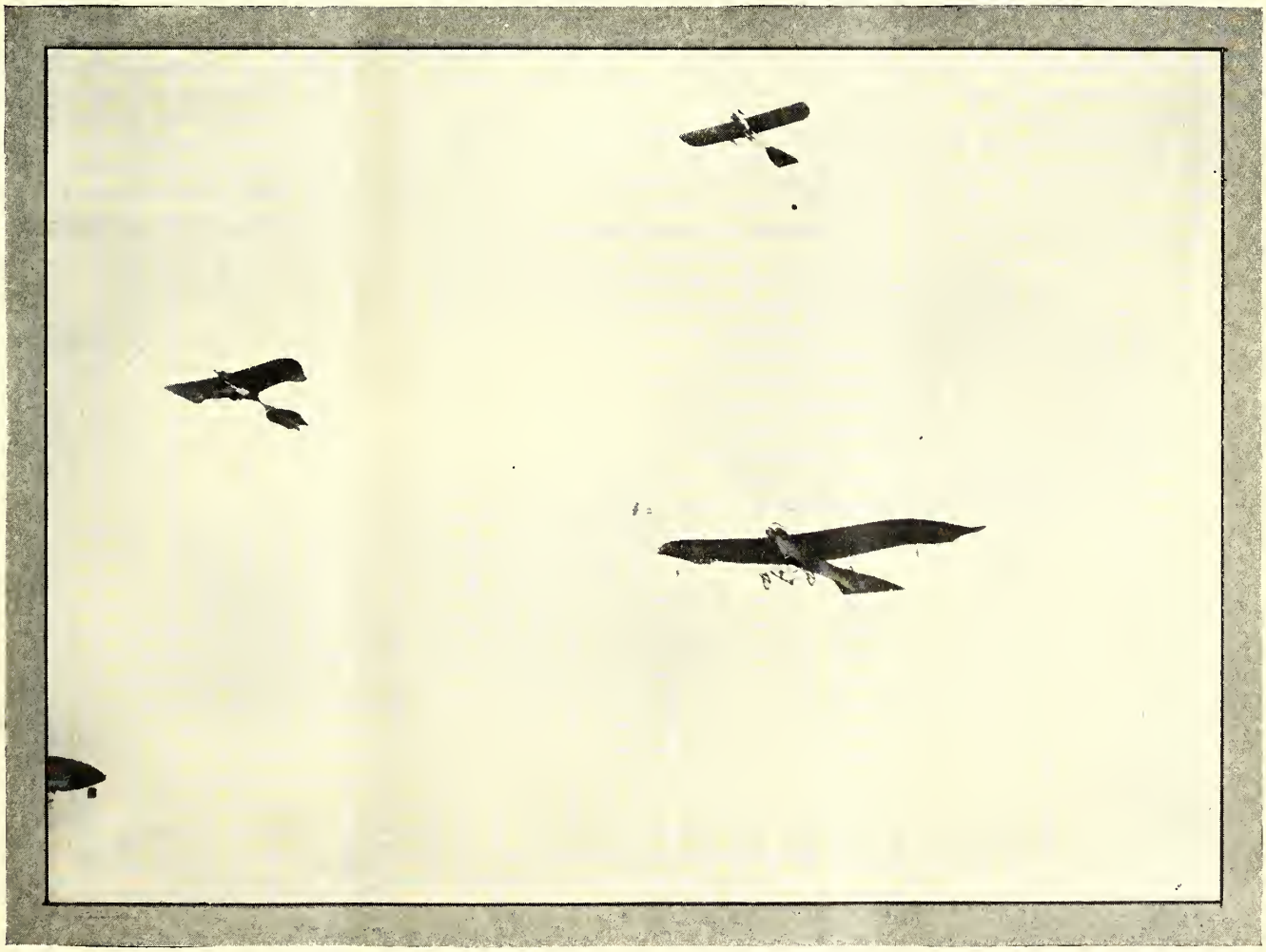
OUR GERMAN RIVALS AGAIN.



An actual photograph taken at Johannisthal; kindly lent by Mrs. R. F. Scott, who was present when it was taken. On the left is the stern of "Parseval VI." Above is Schmidt on a Grade. On the top is Grulich on a Harlan, and to the right is Hirth on an Etrich. In the far distance over the wing of the Etrich may be seen a biplane.

The Michelin Prize, 1910.

The Michelin Prize No. 2, 1911.

The Michelin Prize No. 3, 1911.

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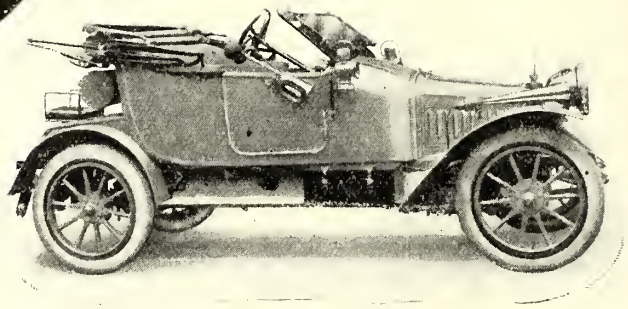

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MATTERS OF MOMENT.

A DIVERGENCE OF OPINIONS.

Mr. Winston Spencer-Churchill's statement on the Navy Estimates, though brief, was certainly satisfactory as far as it went, and one particularly satisfactory feature about it was his statement that a considerable number of aeroplanes both for training and experimental purposes have been purchased in England.

This, of course, is a confession of faith in direct contradiction to Colonel Seely's declared belief that foreign machines ought to be bought because British machines are not safe, and Mr. Spencer-Churchill is to be congratulated either on having more knowledge of the subject or having more trustworthy advisers than has Colonel Seely.

Unfortunately, the net result is likely to be much the same in either case, because the machines for the Central Air Corps School will presumably be bought by Colonel Seely's Committee, under the guidance, or influence, of the Air Corps Factory at Farnborough, and the predominance of British machines mentioned by Mr. Spencer-Churchill will probably consist at first solely in the fact that the Navy have actually bought several machines at Eastchurch without taking the Air Corps School into account. There is, at any rate, some consolation in the fact that they cannot get better built or stronger machines for the purpose, and it seems quite likely that a number of other machines will have to be bought by the Navy separately from the Air Corps altogether, purely for experimental naval work, unless, of course, it is decided to adopt the expensive and inefficient method of building the machines at Farnborough, and transporting them to Sheerness for experiments.

It would certainly be much more satisfactory to have them built at Eastchurch, where every step in their construction can be made under the eye of the officers who have to use them, and they would certainly be built much more cheaply there than at any Government factory, where, in all branches of the Service, unnecessarily large salaries are paid to inefficient officials.

Proportional Development.

One of Mr. Spencer-Churchill's phrases, however, seems to call for comment. He said, "We do not, of course, require in the Navy to develop aviation on the same great scale as in the Army." It seems to the writer that here the First Lord is making a mistake.

In the first place, purely Army aeroplanes can be used under only two conditions—with the expeditionary force, or in case of the invasion of this country any British troops which take part must be in any war in which we may engage outside of this country, any British troops which take part must be greatly inferior in numbers to those of the countries against whom, or in alliance with whom, they are working; consequently, as far as our striking force is concerned, our air fleet must be smaller than those of Continental nations. Germany can put a matter of two millions of men in the field at comparatively short notice, and France could probably raise as many, whereas it would puzzle this country to find more than anyhow half a million men as an expeditionary force.

If we were expecting war in this country, on the other hand, we should, of course, need a military Air Corps rather commensurate with the population than with our standing army, and for this purpose, of course, we must eventually—whatever present plans may be—have an Air Corps of Territorials and Reservists on a suitable scale. But between our expeditionary force on active service and our home defence force in an invasion comes the Fleet, and just as our Fleet is greater in proportion to our Army, so must our naval air corps, as compared with this and foreign nations, be greater than our military air corps.

Coast Defence Considerations.

In this connection it must not be forgotten that, although coast defence work belongs properly to the Army, under the peculiar conditions pertaining to coast defence aeroplanes it is more than likely that these machines will belong to the Naval Wing of the Air Corps, rather than to the Military Wing, for aeroplanes are already classed by the Navy with torpedoes, as is shown by the fact that officially the naval aviators of Eastchurch are on torpedo duty, and therefore the coast defence aeroplanes will come under much the same category as coast defence torpedo boats.

Now when one comes to take our coastal defences into consideration it is fairly obvious that actually, with our enormous coast line and the still more enormously rich country inside it, that particular branch of the Air Corps is likely to be even a bigger thing than either the purely naval or purely military section, and if it is to be run by the Navy, it seems highly probable that, despite Mr. Spencer-Churchill's statement, the Navy will be compelled to develop aviation on a far greater scale than will the Army.

It also seems logical to suppose that the primary idea of both the purely naval and purely military aeroplanes will be, for a considerable period, to act simply as scouts. Both will be exceedingly small, so as to admit of easy transport and packing into very small space, which is equally important in either Service. The coast defence machine, on the other hand, will be of very great size and equipped with weapons for the destruction of hostile torpedo-boat destroyers and lightly armoured scouts, and will itself be the ultimate and most useful development of the hydro-aeroplane.

The Ultramarine.

["There is to be one flying corps, embracing soldiers, sailors, and civilians, all who can fly."—Colonel Seely, Under Secretary of State for War, in the House of Commons, March 4th.]

["It is proposed to train non-commissioned officers and men as well as officers to fly."—Colonel Seely, replying to Mr. Joynson-Hicks, March 7th.]

(With abject apologies to Mr. Kipling.)

As I was hangin' around the sheds, on the top o' Sal'sbury Plain,
I seed a chap with a flying-machine in a kit that give me a pain.
I looks at 'im, an' 'e looks at me, and I ses to 'im, "Wot the 'ell?"
Sez 'e, "I'm a kind of a Ultramarine—sailor and 'civvy' as well."
'E'd a sailor's 'at and a sailor's boots, and the rest of 'im in between
Was a kind of a sort of a uniform, the funniest ever I seen—
A sort of a soldier-civilian suit, wot was fit for a Ultramarine.

An' after, I met 'im all over the shop, a-doin' all kinds of stunts,
Like pushin' a airoplane down to the sea, and fittin' it up with punts,
An' dopin' a engine with castor oil, an' gettin' to like the smell:
'E ain't got no oleofactory nerves—soldier and "tifly" as well.
'E'll sit on the front of a bloomin' box-kite, not thinkin' the risk that they mean,
Or 'e'll 'ang on the tail of a monoplane, when they're startin' up the machine—
'E's built with a wind-tight, oil-proof 'ide, is 'Is Majesty's Ultramarine.

'E sleeps in a 'angar instead of a cot, an' 'e drills with a bundle o' struts;
'Is words o' command is, "Tighten them wires!" or "Lock up them blinkin' nuts!"
For there isn't a job on a flyin' machine, not whether she's riz nor fell,
Comes amiss to the new type Super-Jolly—mechanic and pilot as well.
You can leave him alone with some sticks and some string, an' 'e'll turn up all serene
With a hydroplane float, what 'e's made with 'is 'ands, from a box labelled "margerine."
'E's some of a engine-bloomin'-eer, is the perishin' Ultramarine.

There's some of 'im's sappers, an' some of 'im's gunners, an' some o' im's blue-jackets too,
An' some of 'im's only civilian mechanics, an' much like me and you;
But once 'e's up at three thousand feet, with what 'e 'as seen to tell,
'E's the eyes of 'Is Majesty's Army an' Fleet—observer and pilot as well.
When you're scoutin' around on a four-legged 'orse, penetratin' a cavalry screen,
Or steerin' a blood-stained war canoe, and the fo'c'sle's shippin' it green—
Then pray to the Lord that your own side's got enough of the Ultramarine.

'E's a queer little cherub wot sits up aloft a-givin' the range to poor Jack;
'E's a bald-headed *aas-vogel* scoutin' ahead, when the column is on the *trêk*—
'E'll drop you a bomb on a general's 'ead, like the apple of William Tell,
An' if that don't answer, 'e'll come down 'imself—scout and projectile as well.
You can't see 'is face for the goggles 'e wears, 'is 'elmet's a soup-tureen,
'Is saddle's a kind of a motor-car seat, 'is coat's made of garbardine—
But 'e's all of a absonecessitude, is the Aereo-ultramarine.

C. G. Grey.

The Pioneer: Another Adventure of Micky Halligan.

'Twas when Micky was down in Cornwall last summer. He was flying over one of those wild, wide stretches of moor where it would never surprise ye to see a Druidical procession or a prehistoric monster come walking along, when he noticed a strange machine in the air, flying very slow, and rolling in a way that made him feel ill to look at it.

"What have we here?" says he. "Have the Factory experts been trying their hands at a monoplane?" For 'twas the weirdest piece of construction that ever got off the ground, with the engine carried right out in front of a long shallow fuselage, the wings, that had the ribs running fan-shape from a point in the middle of the leading edge, stuck on half-way down it, a little small triangular elevator at the tail, and no rudder at all.

The thing came too near to be pleasant—indeed, 'twas only by careful steering he saved a collision—and as he passed it, he heard above the hum of his engine a voice shouting, "Come down out of that!" So, just out of curiosity, he came down, and so did the other; and then he saw that what he had taken for the engine was a big ugly head, with two eyes glaring at him very ferocious.

"I have not the pleasure of your acquaintance, I think?" says Micky in his best manner. "For I certainly never saw anything like ye before."

"Take shame to yerself for yer ignorance, then!" says the creature. "Have ye no education at all, that ye don't know a dragon when ye see one?"

"Get along with your nonsense!" says Micky. "Ye are ixtinct. Besides, ye never ixisted."

"I'll show ye whether I am ixtinct or not!" says the other. "I am one of the Pioneers of Aviation, and a discindant of the great Pterodactyl family. Moreover, I am the original and only ginuine invintor of the patent method of warping, which ye are wrongfully and unlawfully using on that machine without licence or consint of meself, and I shall take steps to resthrain ye from doing so."

"Resthrain your great-grandmother!" says Micky, highly amused. "Ye will say next ye have a patent on the use of wings of any sort. I wonder ye do not resthrain the little birds from flying—or perhaps ye have graciously given them permission?"

"That's as it may be," the dragon says huffily. "Ye will please understand I ixpict a share of any profits ye have made, and therefore I will be throubling ye for an account of yer takings."

"Will ye so?" says Micky. "Sure, all I have taken to-day is the turn I got when I saw your iligant physiognomy coming round the corner, and *that* I will be pleased to repay ye with inthrest. I do not know," he says, "whether ye consider yourself a bird or a beast, but ye certainly have not a bird face by any manner of means."

"Face, is it?" says the dragon, getting madder than ever, he being very touchy about his appearance. "If ye could see yer own ye would turn yer back and run away from it! No wan thinks anything of yer looks ixcipt yerself, and the poor silly girleens that cut yer photygraphs out of the picture papers. Had not one of them to be led off the ground in tears the other day, on seeing ye at close hand? Ye know she had. 'Tis only a pity none of them saw ye, the way ye finished up the Circuit of Nowhere-in-particular—shot upside-down in a ditch with two feet of mud and wather in it, and the machine on the bank kicking up its heels in the air for pure joy at having got rid of ye."

Now, for some mysterious reason, that is the one incident in his variegated career Micky hates being reminded of. "See here," says he, very angry, "none of your vulgar personalities, ye bat-winged, ochre-coloured flying crocodile! Ye are badly designed and worse constructed, but what ye need most is a lesson which will teach ye to treat your betters with proper respect; and so sure as my name's Michael Halligan," he says, "ye shall have it!"

He had a neat little coil of wire on board, belonging to the starting release gear he always uses for cross-country work, and while he was talking he fastened one end to the machine, made a running noose in the other, and slung it over the dragon's head before the creature knew what he was after. "Now, me antediluvian dicky bird," he says, starting up on the switch, and quite good-tempered again, "I will give ye a tow, and, for once in your life, ye shall fly."

* * * * * *

"Ye have me beat," says the dragon, badly out of breath, when Micky let him down in a nice comfortable furze-bush after a long half-hour of his most hair-raising circus tricks. "Indeed, I know nothing about flying at all—and if that is the modern style, I have no wish to learn. I will gladly make ye a prisint of the warping patent; and now I think I'll go into retreat for a week."

And he was a changed dragon from that day. The last time Micky saw him 'twas at a school treat at Luxulyan, and he was trotting along taking little children for rides on his back. He told Micky the mere thought of getting off the ground gave him cold feet.

M. L. E.

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PASSENGER FLIGHTS IN MONOPLANE OR BIPLANE.

Some Lessons from Chalais-Meudon.

BY W. E. de B. WHITTAKER.

Now that the War Office and the Admiralty have definitely expressed their intention of providing Great Britain with an efficient aerial fleet, it is well to consider certain points in connection with the addition of new aeroplanes to the Air Corps.

In this country the selection of military aeroplanes has so far been made on strange lines, and no system has been formed. All the Army aeroplanes are two-seaters—that is their sole point of similarity. The different sections of each machine would stand different strains on the different machines—that is to say, there is no officially specified minimum of strength for the component parts of the military aeroplane. The official view on these is, apparently, "let us wait until someone is killed and then strengthen the part that collapsed," or some such simple rule. It is not complex, but neither is it satisfactory. There must be some body in connection with the Air Corps which will be capable of deciding fairly on the minimum strengths advisable.

Selection.

Further, it appears that the authorities do not desire to purchase aeroplanes of any type and make that have not made some flight of distinction. A maker whose machines may be of excellent design and obvious promise stands but little chance of Government orders if that machine has done none of the deeds popular with newspaper reporters. It follows from this that those firms whose purses are long and who are therefore able to employ distinguished aviators to pilot their machines stand in a much better position with regard to Government orders than other firms which, owing to lack of sufficient money, have to employ second-grade pilots. That this should be so is neither ethically fair nor practically politic.

Scientific Research.

It is accepted that the immediate future of the aeroplane is as an engine of war. Therefore, it is to the advantage of any Government to assist in the advancement of the science in so far as is possible without actually financing private firms. There are certain scientific experiments to be made which are beyond the resources of most British aeroplane constructors, and of which the results, though of infinite value, would not bring financial reward commensurate with the initial expense involved. The early experiments of the Voisin brothers, of the Wright brothers, of Blériot, of Robert Esnault-Pelterie, and of a score of others all show the enormous cost of scientific investigation—investigation which in those early days was necessarily carried on by private effort, but which should now be supplemented by Government aid.

To some extent the exalted position held by this small, damp island in the councils of the world is due to its constant devotion to the principle aptly summarised by Mr. Asquith in the phrase, "Wait and see." We rarely take the initiative as a nation. And, before any step of importance is taken, a foreign model must be quoted. Let us, therefore, in the case in point, consider the French official laboratory at Chalais-Meudon. This laboratory was founded some years ago that experiments might be carried out in aerodynamics, etc. In other details it corresponds in some degree to the Air Corps Factory at Farnborough, with one essential difference—it is under immediate military control and its officers are chosen from those eminently qualified for their positions by reason of their intimate knowledge of the science. It is not merely an institution for the spending of public money by indigent and incompetent charlatans.

Duties of the Laboratory.

The principal duty of the establishment is to control the reception of aeroplanes for the French Army. Machines ordered are not delivered direct to the Air Corps, but have first to undergo examination at Chalais-Meudon. Each aeroplane delivered is not examined in detail, but only the first of its type. In the present stage of aviation no maker continues to build machines of exactly the same type for very long, as modifications of design are continually being made.

As in England, military aeroplanes are ordered by the Ministry of War, subject to their carrying out certain tests. They must rise at a certain speed, glide at a named angle, and remain in the air for a fixed period and in excess of a stated speed. Each aeroplane, irrespective of type, has to undergo this test, which, in the case of new types, is performed at Chalais-Meudon. Duplicates of a type already accepted by the Army are actually tested in the air at the different camps of aviation at which they are delivered, or else they are passed by a military commission on the manufacturer's flying ground.

The examination of a new type at Chalais-Meudon is exhaustive and careful. Each part of the aeroplane is put through various tests, and if below a stated minimum strength is rejected. It should be clear that makers are officially informed in advance as to the exact strengths required. Nothing is left to chance or the personal caprice of the examining officer. The wings undergo tests approximating as nearly as possible to, say, three times the strains met with in actual flight. They are not separated from the fuselage during the tests, and the machine is disposed in such a way that both fuselage, wings, and connections are subject to trial at the same time.

An unbreakable wing attached weakly to a fragile fuselage has but little use, and this is rarely allowed for in the common method of testing. The system of wing testing in use at Chalais-Meudon was briefly described last week in these pages in my description of the "artillery type" Blériot.

In France the system of decentralisation which now holds to a certain extent in Army matters puts difficulties in the way of the use of a central repair factory for aeroplanes damaged on service. Quite extensive repairs are made at the different aviation camps, and only the completest of wrecks is returned to the makers for reconstruction. Consequently, after the aeroplanes have once left Chalais-Meudon, they do not return there. In so far would an English Chalais-Meudon differ, as it would probably undertake repairs as well.

A further use of Chalais-Meudon is in the building of experimental machines designed by officers in the French Army. Captain Lucas-Girardville has been stationed at the laboratory since the end of 1909, engaged in the design of an epoch-making aeroplane, so far, one regrets to say, with but little success. Lieut. Blard was appointed a few weeks ago in order that he may build and test a tail-first monoplane which he has already designed. And there are several others engaged on similar work.

Useful Experiments.

Several experiments have been made at Chalais-Meudon during the last two years of incalculable value to the industry in general. As they have been carried out at Government expense the results are equally available to all constructors—another advantage of Government-aided investigation. Recently, for instance, experiments have been made in order to gain certain information as to propellers. These experiments were made on an actual aeroplane in the air and under normal flying conditions. Various ingenious instruments were used and careful notes taken. The results, I am informed, are of great value to constructors. It would not have paid an individual manufacturer to carry out these trials on his own account.

Cannot the Air Corps Factory at Farnborough be reorganised on similar lines? We have, it is true, the National Physical Laboratory at Teddington, but that institution exists for general scientific investigation and can devote but little time to aviation research. Further, one gathers from well-informed sources that in such incursions as they have made into the field of aerodynamics

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the experimenters have not been gifted with intelligence. If the Government desires to have at hand an elastic means of supply of aeroplanes, it is injudicious on their part to permit or to instruct the Air Corps Factory to build aeroplanes in direct competition with the manufacturers. It will need all the orders the Government is able to give to maintain the leading designers and constructors of England. That there are some employees in the factory with considerable ability as designers is proved by the latest biplane designed and built at Farnborough. I am informed by one who is well qualified to judge that this machine is one of high excellence. But, however excellent the products of the factory may be, it is neither just nor expedient that they should enter the field against civil constructors.

Their first duty under reorganisation would be the testing and passing of aeroplanes for the Air Corps and the formation of rules regulating the strengths required in the various parts of an aeroplane. It would be necessary for the factory to be under the command of an officer on the active list, preferably a sapper. In no other way can prejudice and self-interest be eliminated with certainty.

Secondly, the factory would be of great use as a repairing shop for such aeroplanes as are badly smashed by Service aviators. The manufacturers cannot be relied on for this work in the generality of cases. It is hardly worth their while at the prices which would prevail for such work, and the delays incurred might be serious.

Thirdly, in carrying out research work by experimenters of acknowledged ability, some of the problems at present attracting the attention of constructors might be settled for the general good. Exact figures could be published, and the poor but intelligent constructor would derive as much benefit as would his richer competitor.

It may not be generally known that, in connection with the military aeroplanes now being purchased by the Government, the Air Corps Factory officials, in whose hands the selections actually rest, are applying to the manufacturers for stress diagrams and other minute particulars of their machines. The correct course, it would seem, would be for the Air Corps Factory staff themselves to resolve by experiment the minimum strengths permissible, rather than to acquire the elements of their education from the designs and at the expense of outside constructors.

"Naval Aviation and the Air Corps."

I am informed by a naval officer of distinction that my remarks about the Hague Conference and the dropping of bombs from airships and aeroplanes are partially inaccurate. The sentences of importance in the resolutions dealing with this matter are as follows:—"The Contracting Powers agree to prohibit, for a period extending to the close of the Third Peace Conference, the discharge of projectiles and explosives from balloons or by other new methods of a similar nature. The present Declaration is only binding on the contracting Powers in case of war between two or more of them. It shall cease to be binding from the moment when, in a war between the contracting Powers, one of the belligerents is joined by a non-contracting Power. In the event of one of the high contracting parties denouncing the present Declaration, such denunciation shall only operate on the expiry of one year after the notification made in writing to the Netherlands Government, and forthwith communicated by it to all the other contracting Powers. This denunciation shall only operate in respect of the denouncing power."

The Contracting Powers signing and ratifying this declaration at The Hague on October 18th, 1907, were the Monarchies of Great Britain, China, and the Netherlands, and the Republics of the U.S.A., Bolivia, Salvador, Nicaragua, and Haiti. It will thus be seen that the prohibition of bomb dropping only affects a few nations, and is only binding when these are at war with one another, and no non-contracting Power enters the field.—W. E. de B. W.

French Military Aviation.

Since the time when the aeroplane first took its place officially in the organisation of a field force no trials have been made in order to determine their actual value as a means of obtaining certain definite information. That is, though aerial scouts have been employed during the French manœuvres of the last two years for the purposes of reconnaissance, the lessons learned have been those of general principle rather than of detailed observation. Nothing was known with certainty as to the exact uses of an aeroplane in war.

From March 4th until March 13th several military aeroplanes were attached to the 25th Regiment of Artillery at Mailly Camp. The "escadrille," which was under the command of Capt. Barrès, consisted of three sections, as follow:—

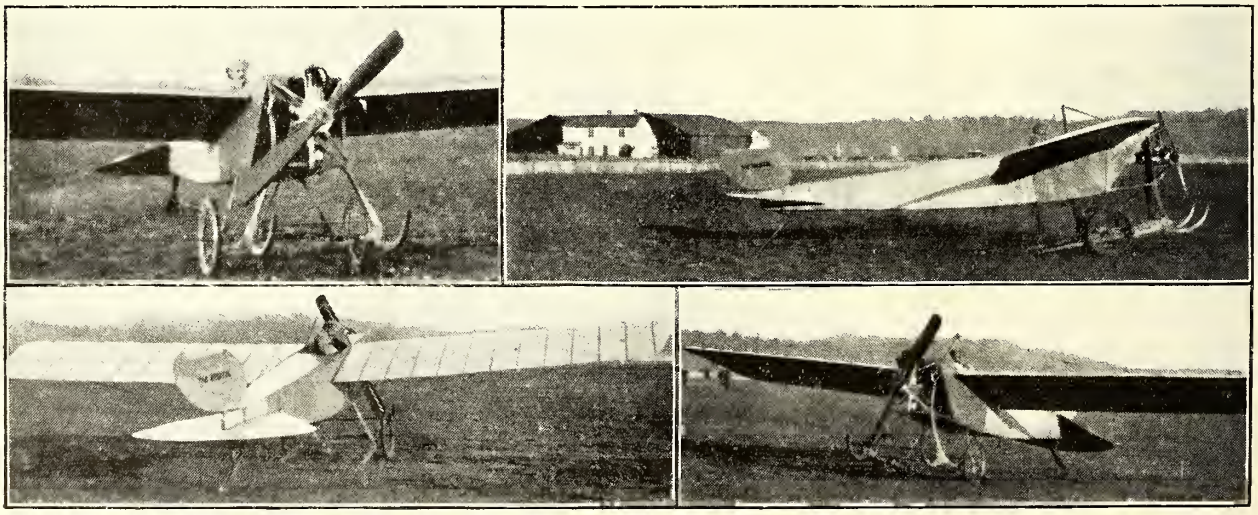
(1) Two Blériot monoplanes (single-seater), Lieutenant-Aviators Lelièvre and Yence.

(2) Two two-seater Maurice Farman biplanes, Lieutenant-Aviators Bettini and Versein.

(3) Two two-seater Bréguet biplanes, Lieutenant-Aviator Migaud and Sapper Brégi. These latter two acted as military aviators for the period in question.

In addition there were four Blériot monoplanes (single-seaters), two Maurice Farman biplanes (two-seaters), and one three-seater Bréguet biplane. These machines were flown chiefly by reservists, among whom were Renaux, Fourny, and Moineau.

Those officers who were going through the practical course in aviation at Chalons, under the command of Colonel Nollet,



The Bristol-Anzani School Monoplane at Brooklands, with Capt. Allen, Welch Regiment, on board.

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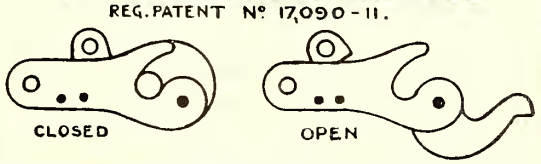

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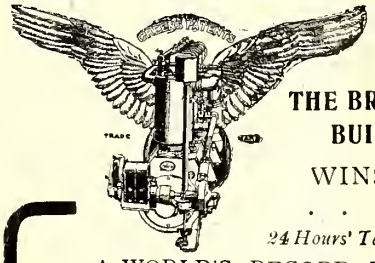

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PARIS *BOOKLET "CHAIRS" FREE* BUENOS AIRES

were present during the observations. Lieutenant-Colonel Estienne, commandant of the aviation camp at Versailles, was also present.

Each day, when the weather was suitable, the artillery fire was directed from aeroplanes. It was found that for range-finding, etc., the single-seater was quite sufficient. The pilot, after observing the descent of shells, simply dropped a weighted slip of paper bearing the words " Too short " or " Too long," as the case might be.

For extended detailed observations it appeared that a multi-seater, such as the three-seater Bréguet was of most use. On several occasions the officer commanding the artillery made observations himself as a passenger in a multi-seater. It is suggested that as a result it will become recognised practice for artillery officers to make personal observations of the enemy's position from an aeroplane. The lessons learnt will naturally not be published broadcast, but there are certain channels through which information will ultimately leak. The ordinary Service aviators intend to continue this observation practice for some time to come, both at Mailly and elsewhere.

A military aviation section under the command of Captain Eckemann and consisting of Lieut.-Aviators Lelièvre and Chabert and 25 N.C.O.'s and men have just completed a long march through France in charge of a convoy of twenty horses, four wagons and one special trolley. The latter contained an artillery-type Blériot monoplane folded up, and was attached to a horse-drawn wagon. Two of the wagons also had in them ordinary Blériot monoplanes with wings removed. The remaining wagon was motor-driven, and contained repair kits and supplies.

The entire journey has lasted a month, ending on March 25th at Vincennes. The column visited, amongst other places, Orleans, Pithivers, and Melun. At each town of rest *en route* the monoplanes were made ready for the air, though actually no flights were made. Captain Echemann told a reporter of *L'Auto* that he was delighted with the success of the journey, for, despite the bad roads over which the column travelled, neither the wagons nor aeroplanes suffered any injury whatsoever. He spoke highly of M. Blériot's constructional work. This journey has certainly shown the mobility of aeroplane transport columns.

On March 20th Lieut.-Colonel Boutteaux, the director of the aviation centre at Chalais-Meudon, arrived at the aerodrome at Buc by way of the air as a passenger on a biplane piloted by Captain Barrès. Assisted by Captain Destouches, of Chalais-Meudon, Captain Charet, and Lieut.-Aviator Ludmann, he examined a new type motor-transport-wagon for the conveyance of a R.E.P. monoplane, military type. The overall dimensions of the wagon with the aeroplane on board are: length, 8 metres; width, 2.5 metres; height, 2.5 metres. The wagon was driven once or twice over the ground in front of the sheds, and then the mechanics started to assemble the aeroplane. Thirty minutes later Mr. Gordon Bell began a short flight on the machine. After the flight the monoplane was repacked on to its wagon in fourteen minutes and the trial was successfully concluded.

The first attempts on the Michelin bomb-dropping competition were made on March 24th at Chalons. Three officer-aviators, Lieutenants Bousquet, Mailfert, and Gaubert, all on biplanes, each carried fifteen projectiles, weighing 7 kil. 100 grammes severally, and these had to be aimed at a target 20 metres in circumference. Lieutenant Riley E. Scott, late Coast Artillery, U.S.A. Army, has entered his apparatus for launching bombs for the special prize offered for such machinery.

M. Millerand, Minister of War, has issued an order forbidding officer-pilots and pupils from flying monoplanes for the present. In the report made by Captain Voyer on the fatal accident which happened to Lieut.-Aviator Sevelle at Pau some days ago a statement is made that the staying of the upper surfaces of the wings of certain monoplanes is insufficient. It appears that in Lieut. Sevelle's accident the wings broke *downwards* while in the air. Under the terms of the order no flights will be made on army monoplanes until such constructional alterations are made as will prevent the recurrence of such an accident.

The immediate result of the order will be the suspension of such practice as that being made in connection with an artillery regiment at Mailly Camp. The existing strong feeling in favour of the biplane amongst French Army pilots will become yet stronger in consequence of Captain Voyer's report. Biplanes have rarely been known to collapse in the air, though such accidents are less infrequent with monoplanes, possible owing to the much higher speed of the latter.

That flying should be suspended for a time on monoplanes is by no means an unqualified evil, as the greater number of French military aeroplanes require a complete overhaul. Fatal accidents to military aviators have increased latterly to a degree disproportionately greater than the increase in the number of army pilots, and this increase may fairly be attributed to the neglected state of the machines which are miscared for at the military schools.—W. E. de B. W.

Mr. Gordon Bell, who has been demonstrating to the French Military Authorities.

Russian Military Aviation.

The Russian Ministry of War has set aside in this year's budget a sum of 2,500,000 roubles (£265,000) for the purchase of 120 aeroplanes and five dirigibles during 1912. The dirigibles will be constructed entirely in Russia. Nothing will be decided as to the types of aeroplanes to be purchased until after the military aviation trials of next summer. The Ministry of War is engaged on questions of organisation at the moment, and nothing further is yet announced.

At Sevastopol on March 23rd Lieut.-Aviator Albokrinoff and his passenger were both killed through the Farman biplane

they were flying sideslipping owing to a sudden gust. This is the second time a pilot and passenger have been killed at Sevastopol.—W. E. de B. W.

Belgian Military Aviation.

Lieut.-Aviators Sartoel, Dhanis, Moulin, Rochet, Bronne, and Stellingwerff begin their training at Braschaet on April 1st. Lieut.-Aviator Nélis, commanding Aviation Camp, Braschaet, has ordered four small 70-h.p. biplanes for school work. The Belgian Army will then possess seven machines in all.

A landing place is being laid out on the plain of Malchamps, near the frontier. The opening of the ground will be celebrated by flights made from the hills during the feast of the Pentecost.—W. E. de B. W.

Turkish Military Aviation.

The Turkish Ministry of War has decided to purchase four two-seater monoplanes. It is intended also that six officer-pilots and eight mechanics shall be trained in France. A military camp will be formed at San Stefano.—W. E. de B. W.

U.S.A. Military Aviation.

It was announced on January 22nd last that it was intended to add eight new aeroplanes to the aviation section of the U.S.A. Army between March 1st and June 30th. Of the $125,000 granted last year by Congress for military aviation Brigadier-General James Allen, C.O. Signal Corps, U.S.A. Army, of which the Air Corps forms a section, has $65,000 still unspent. This sum is to be expended at once on aeroplanes to bring up the total number owned by the Air Corps to fifteen or sixteen.—W. E. de B. W.

The London-Paris Record.

Apparently M. Salmet's flight from London to Paris was even more remarkable than was at first thought, for it is now made known that he actually landed on the way to Paris at a farmhouse so as to make sure of where he was, warmed himself, and had breakfast, and made several circuits round about before resuming his route, and yet he managed to complete the journey of 240 miles in 3 hrs. 12 min., which gives him a speed of something like 65 miles an hour, including the stop. If one allows half an hour only for getting down from the altitude at which he was flying, stopping, visiting the farmhouse, and climbing back to his original height, it leaves him only about 2 hrs. 40 min. for the complete journey, so that his actual speed from place to place must have been very close to 90 miles an hour.

It may have been noted that The Aeroplane, in reporting M. Salmet's flight, did not refer to it as a non-stop flight, as at the time full details were lacking; but those who fell into the error of calling it a non-stop may well be excused, for without a very full knowledge of the capabilities of the Blériot machine when assisted by a favouring wind it must have seemed almost impossible for the journey to be done in the time if any stop was made.

From South Africa.

Writing from Johannesburg on March 5th, Mr. Compton Paterson says:—"Have been doing some fairly good flying here although some 6,000 feet above sea-level to start with. Quite well again and all going strong

"Driver had a nasty landing accident last Wednesday, absolutely jiggered the monoplane, but he came out unhurt. I think came down from 2,000 feet at too steep an angle and landed at too great a speed, the usual monoplane landing smash, with a somersault. Now hard at work rebuilding. Have all spares, etc., here, so don't expect much touble.

"Taking things all round having a fairly good tour. Africa is a very interesting country, and when I return I'm going to turn out a machine which will suit the conditions one meets with here. There are stretches of country miles and miles every way with not a pimple in sight, but the ground, although perfectly flat, is far from being smooth; but will have a nice long chat with you *re* this when I return. Glad to hear things are bucking up in England.

"I made a flight a few days ago over a native camp, and, by jingo! talk about wild Indians! They couldn't compare with the dances and antics the Kaffirs put up when they caught sight of a human being in the machine.

"A funny thing happened the other day at a meeting. Driver and I had put up some fairly good flights and we asked Livingston to announce that we were sorry that the wind was so tricky otherwise we would have remained in the air longer and given a more varied show, when one of the crowd shouted, 'Where is the wind?' I turned round and collared him and we literally dragged him to the machine and told him we would show him where the wind was.

"I gave him the roughest five minutes he ever had, I'll bet. I just let the machine feel every gust and then landed him in front of the grand stand so that he could relate his experiences, which he did quite well. Everybody was quite satisfied.

"Don't quite know where we are going to next. All here send their kindest regards to all the knuts at home."

Hydro-Aeroplanes at Monaco.

The hydro-aeroplane meeting at Monaco began on March 24th. To the list of entrants published last week must be added Baillod, flying an aeroplane of his own construction. Colliex opened the proceedings on the 24th by making a brilliant flight over the yachts in the bay at a height of about 50 metres. A full description will be given of the meeting in next week's issue of The Aeroplane.

French National Aeroplanes.

On March 25th the subscription started by *Le Matin* for the purchase of aeroplanes for the French Army amounted to 2,021,968 francs in all (£80,878 roughly). Half a million francs of this sum has already been paid over to the Treasury, and the purchase of 33 aeroplanes will be arranged at once.

The big Dirigible Sheds at Johannisthal, from a photograph kindly lent by the Hon. Lady Shelley, and taken while she was a passenger in "Parseval VI."

London's First Aviation Meeting.

Given decent weather at Easter, and a little long-deserved luck for the promoters, London is to have its first real aviation meeting. Wolverhampton, Bournemouth, and Lanark have all had properly organised meetings, but London has never had anything except casual exhibition flying at Hendon and Brooklands, and, of course, the start of the Circuit of Britain, the landing of the competitors in the European Circuit, and the Parliamentary demonstration. Now, however, the omission is to be repaired, for Mr. Claude Grahame-White is organising a really big meeting at Hendon for three days during the Easter Holidays. There are to be races round a pyloned course, climbing speed competitions, competitions for variation in speed of the same machine, and an out-and-home cross-country handicap from Hendon to St. Albans and back.

Hundreds of thousands of people took the trouble to get up in the middle of the night to go to Hendon and see the start of the Circuit of Britain, and all they saw was about a dozen machines get off the ground and disappear in the distance. This time they will be able to watch equally fine fliers, some of them on machines which are much faster than those which flew in the "Circuit," performing for hours on end, and racing round pylons makes a far finer display of skill than does cross-country flying thousands of feet in the air. The figure of eight competitions and the relay races will be particularly interesting to watch. The cross-country handicap to St. Albans and back will be the first genuine steeplechase seen in this country, and with skilful handicapping it should result in a real race across the finishing line.

There will be racing and competition flying on Good Friday, Saturday, and Easter Monday. On the Sunday there will be no competitions, but there will be a large amount of exhibition flying and passenger-carrying by the various competitors, so that day will be quite as interesting for the spectators.

Mr. Grahame-White himself will not compete in any of the events, which is distinctly good sportsmanship on his part, for his 70-h.p. Nieuport is obviously much faster than any other machine at present in this country, and his experience of racing round pylons would give him another big advantage over all but a few of the aviators who are likely to compete. Nevertheless, he will do a great deal of flying every day of the meeting, and his handling of the racing Nieuport is likely to be somewhat startling to those who have so far only seen old-fashioned biplanes and the earlier types of monoplanes performing.

The programme of competitions is as follows:—

Good Friday's Events.

On Good Friday, April 5th.—Exhibition Flights from 2.30 p.m. till 3.30 p.m.

3.30 p.m. to 4.30 p.m.—First section of Three-Day Grand Speed Contest.

This race will be flown round a pyloned course 1½ miles in circumference, and each competitor will fly 10 laps on each day of the meeting. Two, and if possible three, machines will be allowed to fly at the same time. The prizes will be £100 first, £25 second, and £10 third, and the entry fee will be £2 per competitor. It should prove a most interesting competition, given fair weather.

4.30 p.m. to 5.30 p.m.—Fast and Slow Passenger-Carrying Competition. This will be a competition over 10 laps. The competitor, with a passenger, is to fly 5 laps as fast as possible, and then 5 laps as slowly as possible, the winner to be the one whose speeds show the greatest difference, the idea being to develop the type of machine which can fly fast and yet slow down for landing. The first prize is a handsome trophy and £10 in cash; and the second prize £5; the entry fee being 10s. This event should certainly show some clever flying.

5.30 p.m. to 6.30 p.m.—Altitude Speed Competition.—In this case each competitor is to carry a barograph, and the winner will be he who gets up highest and lands again within 15 minutes, so that the machine which climbs quickest wins. The only difficulty is, of course, that a competitor may go on climbing too long, and, to avoid being penalised, may come down too steeply and fail to flatten out on landing, but there is actually no other satisfactory method of timing for quick climbing, and, after all, the competitor himself ought to be the best judge of how steeply he can descend with safety. The first prize is a trophy and £10 in cash, and the second prize is £5; the entry fee is 10s.

Saturday's Competitions.

On the Saturday, the meeting opens with the usual exhibition flights from 2.30 p.m. to 3.30 p.m., and thence till 4.30 p.m. comes the Figure of Eight Speed Competition. In this race each competitor must fly one lap of the complete course, and then six figures of eight round two pylons at opposite ends of the course, finishing with another complete lap. This should give a fine exhibition of really skilful flying. The first prize is £20 in cash, and the second £10; the entry fee being 10s.

From 4.30 p.m. to 5.30 p.m. is the second stage—10 laps—of the Three-Day Grand Speed Contest.

From 5.30 p.m. to 6.15 p.m. there will be a 10-lap monoplane handicap, to give the lower-powered school monoplanes a chance of distinguishing themselves. In this the first prize will be £20 and the second £10, with a 10s. entry fee.

The Easter Monday Show.

If the weather holds out, there should be a great day's flying on Bank Holiday, and it will be worth everyone's while to make a day of it at Hendon, for the exhibition flying will commence at midday, and continue till 1.30 p.m., when the Biplane Handicap will start. This also will be a 10-lap event, and should bring out quite a good display of box-kites, though it is to be hoped that a tractor biplane or two will be induced to compete, just by way of showing more recent developments in biplanes. The first prize is £20, and the second £10, with a 10s. entry fee.

From 2.30 to 3.30 p.m. will be the final stage of the Three-Day Grand Speed Contest, and the competition should be very keen, for by then the competitors will have had plenty of practice in flying round pylons.

At 3.30 p.m. the great race of the meeting will start. This is the Cross-Country Handicap for all types of machines from Hendon to St. Albans and back. The total distance is about 22 miles, and the competitors will be started in order of their handicap, so that if the handicapping is good the competitors should arrive back in a bunch. As they will finish across a line the width of the aerodrome, and need not alight till they please, there need be no fear of their getting mixed up on the ground. This should prove quite an exciting event, for the competitors ought to be seen returning some miles before they reach the aerodrome, though it will be impossible to see who is in front till they are quite close. The first prize for this race will be £50, and the second £20; the entry fee being £1, and it is hoped that quite a large number of aviators will compete.

From 4.30 to 5.30 p.m. there will be a Relay Race which ought to provide plenty of amusement. In this the competitors will work in pairs, one flying a single-seated machine, and one a two-seater. The pilot of the single-seater will be given a check, or an envelope, and with this in his pocket he will fly two laps. On alighting—as near as he can to the starting line—he will jump out of his machine, run to his team-mate's two-seater, get on board as passenger, and the pair will then fly another two laps, finishing as near the judges' enclosure as they dare, and running together hand over the check to the judges. The pair getting through the whole performance in the quickest time will be the winners. The first pair will receive £20, and the second pair £10, and the entry is 10s. per competitor.

The final event of the meeting will be an Altitude Passenger-Carrying Competition from 5.30 p.m. to 6.45 p.m. In this there will be no time limit, and, given a calm evening, it is hoped that someone may break the World's Passenger Height Record. Enormously high flying on a fine evening is a most impressive sight, and it should make a splendid finale to a skilfully arranged programme. The prize will be £25, presented by Messrs. Teofani, the entry fee being 10s.

The whole meeting will be flown under the new competition rules of the Royal Aero Club. Mr. Grahame-White and his manager, Mr. Richard Gates, are to be congratulated on the excellent way the programme has been mapped out, and it is to be hoped that their enterprise will be rewarded with perfect weather and a bumper attendance.

Special Concessions.

By courtesy of Mr. Claude Grahame-White, and Mr. Richard Gates, manager of the London Aerodrome, The Aeroplane has been able to arrange that any of its readers visiting Hendon during the First London Aviation Meet on April 5th, 6th, 7th, or 8th will be admitted to either the 1s. or 2s. 6d. enclosures at half-price, on presenting the voucher which will be found elsewhere in this issue, and it is hoped that full advantage will be taken of this liberal offer, which is part of Mr. Grahame-White's scheme to popularise aviation.

The Royal Aero Club Meeting.

The annual general meeting of the Royal Aero Club took place on Thursday last, Mr. Roger Wallace, K.C., being in the chair. Mr. Wallace gave a brief summary of the development of British aviation since the last annual meeting, and referred feelingly to the deaths of Mr. Benson, Mr. Napier, Lieut. Cammell, Mr. Oxley, and Mr. Gilmour. He mentioned the great competitions which have taken place during the past year, and pointed out that £16,300 had been won in prizes. He also proposed a vote of thanks to the donors for, as he put it, "doning these prizes." Attention was drawn to the excellent performances of Messrs. Prier, Salmet, Valentine, Hamel, Ogilvie, Pixton, and Cody; and the world's passenger-carrying records of Capt. Gerrard and Lieut. Barrington-Kennett were also noted.

Mr. Wallace spoke of the excellent flying done by the Cody, Bristol, Short, Martin-Handasyde, and Valkyrie machines as evidence of the good work done by British constructors, and also mentioned the Green and N.E.C. motors.

Speaking as to the influence of the Royal Aero Club abroad, he pointed out that they had been successful in securing the Statue of Liberty prize for Mr. Grahame-White, and had persuaded the committee of the International Federation to recommend other nations to appoint stewards of their various clubs on the lines recently instituted by the Royal Aero Club. He announced that the finances of the club were in a satisfactory condition, showing a balance of £2,091. Mr. Wallace also announced his own resignation from the chairmanship of the club, and promised his whole-hearted support to his successor.

Mr. Harold Perrin then announced the names of the new members of the committee, and said that 441 voting papers had been received, of which 11 were rejected because the wrong number of candidates had been marked, and 5 because they were signed.

The members elected for the committee are :—

Colonel Capper, R.E.,	Commander Samson, R.N.
Mr. Cockburn,	Mr. Mortimer Singer.
Capt. Fulton,	The Marquess of Tullibardine,
Mr. Moore-Brabazon,	M.P.,
Sir Charles Rose, M.P.	Mr. Roger Wallace, K.C.

A request was made to the chairman that the number of votes cast for each candidate should be announced, but he pointed out that such figures had never been given before, and that he personally thought it would be invidious to announce them. However, he put the question to the vote, and the request was defeated.

Admiral Sir Edward Seymour then presented the various medals, and, before doing so, remarked that the science of aviation called for more energy, courage, and readiness of resource than any other science with which he was acquainted. As a naval officer, he was glad to see that the Navy was paying such attention to aviation. Aeroplanes must play a most important part in the next war, and the Italian operations in Tripoli had given us a very small idea of what must be done in the future.

Mr. Grahame-White received a medal for winning the Gordon-Bennett Race in America, and Mr. Robert Loraine also received a medal for his flight across the Irish Sea in 1910. Sir Edward Seymour remarked that this performance would always rank high amongst sporting feats, as it was done without any prospect of reward. As a matter of fact, in the opinion of many good judges, Mr. Loraine's performance is reckoned as one worthy to be commemorated in some very much more substantial manner than by the presentation of a silver medal. Curiously enough, the feat is much more highly thought of on the Continent than it was, even at the time, in this country.

M. Prier then received a medal for his non-stop flight to Paris. Messrs. Cody, Valentine, Ogilvie, Drexel, and Radley were also called upon to receive medals, but were not present. Mr. Pollock took a medal for a balloon performance, and then Mr. Percy Grace was asked to accept, on behalf of his family, a gold medal from the club in recognition of the services to aviation of his brother, the late Mr. Cecil Grace. The members of the club stood while the presentation was made, as a mark of respect for the memory of Mr. Cecil Grace, who will ever be one of the most deeply regretted of the victims of aviation.

Mr. Wallace having thanked Sir Edward Seymour for presenting the prizes, Mr. Robert Loraine, seconded by Mr. E. V. Sassoon, then proposed a vote of thanks to Mr. Wallace for his services to the club in the past.

The Aeronautical Society.

A meeting of the Council was held on Wednesday, March 20th. The following were elected members of the Society: Claude Grahame-White, Brig.-Gen. D. Henderson.

The following have been appointed to serve on the Research Committee: Harris Booth, T. W. K. Clarke, B. G. Cooper, Col. J. D. Fullerton, R.E., B. M. Jones, Archibald R. Low, Mervyn O'Gorman, A. P. Thurston.

It has been decided that, as a general rule and when possible, a precis of the papers about to be read before the Society shall be published in the Press before their delivery, in order to facilitate discussion.

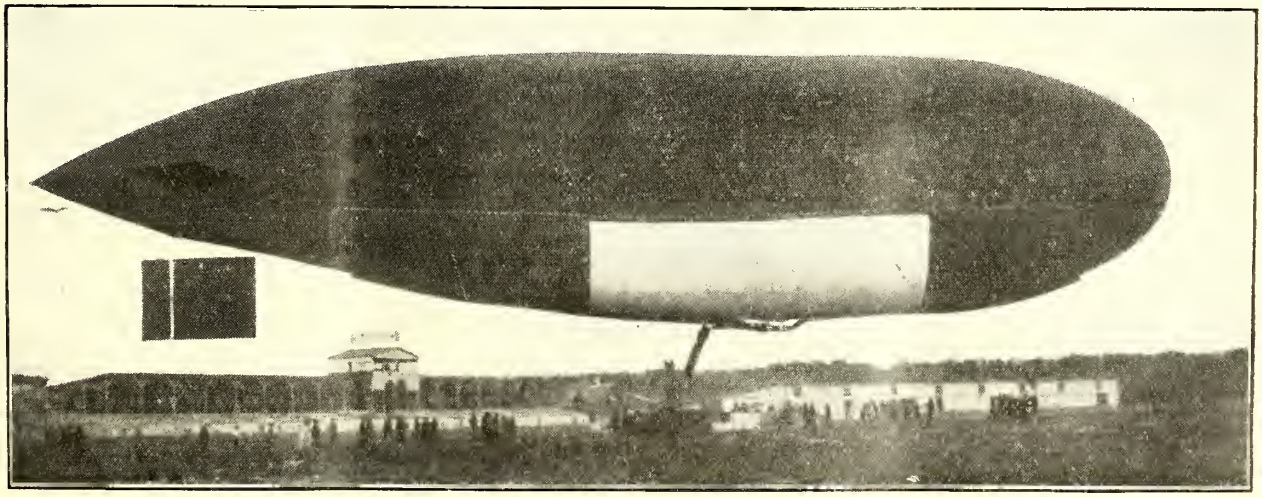
A meeting will be held at the Royal Society of Arts, John Street, Adelphi, on Monday, April 15th, at 8.30 p.m., when Mr. T. W. K. Clarke will read a paper on "Aeroplane Stability, with a descripiton of a new gyroscopic apparatus" (which will be shown in action).

Owing to the Easter Holidays and Mr. Clarke's paper the next informal meeting will be held on Monday, April 22nd, when the subject for discussion will be the "Atmospherical Conditions at Hendon Aerodrome."

DOWNWARD FORCES ON WINGS.

As is noted in this week's Military Notes, an order has been issued by the French War Office forbidding monoplane flying by officers, pending the checking of certain discoveries relative to the resistance of wings to downward gusts. The determining cause of this order was the accident which caused the death of Lieut. Sevelle, who was killed at Pau on a Blériot. The following study of the subject is based on information taken directly from M. Blériot's own report.

There are four other well-remembered accidents which have direct bearing on the subject: the deaths of Chavez, Blanchard, Lantheaume, and Ducourneau. In each of these cases the accident occurred after a long flight in rough weather, in each



"Parseval VI," one of the most successful German dirigibles, taken at the Johannisthal Aerodrome.

case a wing collapsed, and after each accident the wing-spars were further strengthened; but only after the fifth accident—Lieut. Sevelle's—did M. Blériot have opportunity for careful examination of the wrecked machine. He found that all the *upper* tie wires were broken and sheared.

Hitherto, all the wing strengthening has been on the lower side: top staying is made strong enough to hold the weight of the wings, and has been left at that; the factor of safety has been increased in the light of investigation into conditions at the end of a dive, but now one must inquire into the happenings at its commencement.

It is already known that if a machine is flying horizontally, and its engine is stopped, it tends to "pick up its gliding angle," as it is called. This, of course, does not happen instantaneously—the machine's inertia forbids: the result is a curved path, which eventually becomes a straight line inclined to the horizontal at the natural gliding angle of the machine. But suppose the pilot (as he so often does) cut off the engine and simultaneously throws forward his cloche. The machine will dive at a sharper angle, and there will be the risk—earlier treated (in reference to the accident to Oxley at Filey)—of upward breakage on flattening out.

But also it will *commence* its dive more sharply; and here we have, as on flattening out, the effects of centrifugal force. It was shown that this force might amount to nine times the machine's weight. From this must be subtracted the weight of the machine, which in this case acts against the force. This leaves us eight times the machine's weight. But that force was developed at a speed much above normal—in fact, about two and a quarter times the average flying speed. The square root of two and a quarter is one and a half, so our eight times weight must be divided by one and a half.

Finally, we see (as far as this very rough and cursory investigation can show us) that the possible downward load on the wings, on starting to dive, is of the order of five to six times the weight of the machine, or rather more than half of the possible upward load. So, whatever factor of safety there is in the lower stays, the upper staying and cabane should be two-thirds as strong as the lower.

It is also necessary to remember that, since inertia is so important (but yet so neglected) a consideration in flying, factors of safety must, to some extent, depend on speed; for inertia varies as the square of speed. So that if a factor of safety of six below and four above suffice for a machine of 50 m.p.h., then factors of twelve and eight must be used at a speed of 70 m.p.h.

Lastly, it must be remembered that, even if a given machine is safe against sudden stresses of many times its own weight, yet the pilot is not; for an upward jerk may lift him from his seat, and one cannot call for experiments as to the amount of sudden downward pressure which will cause grave danger of internal injuries.

As has been noted above, these notes are condensed from M. Blériot's thesis; and while, as translator, I must express my entire concurrence with them—and while I myself have added the paragraph which compares with Oxley's death—I must own that I have not yet sufficiently studied the question to know whether or no there may be other and unknown causes at work.—P. K. T.

The D. G. Gilmour Memorial.

There is further satisfactory progress of the D. G. Gilmour Memorial Fund to record this week, and subscriptions continue to come in on a very generous scale. The subscription book at Brooklands has been responsible for a further increase, and Mrs. Handasyde has collected another £12 15s. 6d., much of this having been collected during a motor-cycling meeting on Wednesday last, for D. G. was formerly well known as a racing motor cyclist. Donations large or small towards the fund will still be welcomed from those who would like to help in perpetuating the memory of one of the pioneers of aviation. Readers are reminded that shillings are quite as welcome as are the larger sums. The general consensus of opinion seems to be in favour of an annual donation to the Weybridge Cottage Hospital, and it is hoped that a sufficient sum will be raised to ensure the annual gift being adequate to recompense the hospital for the various repairs it is called upon to do.

The following is the present state of the list:—	£	s.	d.
E. C. Gordon-England	5	5	0
J. Herbert Spottiswoode, Henry Knox, W. B. R. Moorhouse, E. V. Sassoon—£5 each (4) ...	20	0	0
Staplee Firth	3	3	0
The Brothers Pashley, Howard T. Wright, T. O. M. Sopwith, G. M. S., E. W. Edwards, C. G. Grey, C. G. Grey (senior), Fred May—£2 2s. each (8)	16	16	0
E. T. Willows, Harold Perrin, Eric Clift, Frank McClean, Norbert Chéreau, Maurice Ducrocq, N. S. Percival, Ronald Charteris, Lieut. C. G. W. Head, R.N., Lieut. E. G. Bower, R.N., Howard Pixton, R.N.Mess (Eastchurch), Robert Loraine, G. S. Wilson, Thos. Gillet, Alex. Keith, W. O. Manning—£1 1s. each (17) ...	17	17	0
Robert Martin, Giovanni Sabelli, H. Petre, R. W. Gill, Lieut. Wilfred Parke, R.N., Major Sir Alexander Bannerman, R.E.—£1 each (6) ...	6	0	0
Ronald Kemp, P. K. Turner, Seymour Metford—10s. 6d. each (3)	1	11	6
Mrs. Hilda Hewlett, E. V. B. Fisher, L. Howard Flanders, Granville Bradshaw, H. P. Nesham, A. W. Furbank, E. F. Chinnery, Lieut. W. D. Beatty, R.E., Claude Bettington, A. Dukinfield-Jones, E. C. Hammer, C. P. Pizey, H. R. Fleming, Miss Bowker, W. D. Johnstone, C. L. E. Grack, Herbert Spencer, R. Beaulitt, T. Garne—10s. each (19)	9	10	0
S. H. Davis, F. R., J. R. D., G. B., E. A. G., H. Blackburn, W. Stanhope Spencer, C. A. H., T. Ingram Walker, P. M., R. P. C., Lucas' Stores, F. Sigrist, J. A. Anderson, A. V. Roe, L. Marcus, M. and H. Staff, Nell and Frank, G. H. A., J. Alcock, Miss Bacon, J. Furley Smith, Miss M. L. Elliott, M. Tombs, C. Digby, M. Barry, H. Jaques, Brian Dodds, M. Tulca, R. C. Griesbach, W. C. Bridge, H. O. F., G. A. Taure, F. S. S. Dawson, M. E. P. Wright, R. S. Young, C. R. Higgins, K. K. Horn, Mrs. Nesham—5s. each (39)	9	15	0
J. H. Brownrigg	0	4	0
J. D. Gülich	0	3	0
E. M. W., W. P., P. R. C. G., W. A. S., C. H. B., G. C. G., F. C. B., F. W. M., L. M., Ch. Pellassy, J. W. Smith, H. T. Lane, S. V. Setti, H. J. Ll., "Darracq," W. G. Aston, E. L. Baldwin, A. W., A. Hunter, F. Conway, G. W. G. Brooker, A. J. Mansfield, W. S. Duke, V. R. B. Weeding, D. S. Young, L. W. Cox, G. H. W., E. N. P., L. Williams, C. H. D.—2s. 6d. each (30)	3	15	0
W. H. W., T. E. C., , B. H. F., P. Hills, G. W., J. M. D., G. A. F., R., S. D., H. L. Batty Smith, J. Smyth, A. A. Ll., V. T., D. S.—2s. each (14)	1	8	0
H. Dibdin, N. S.—1s. 6d. each (2)	0	3	0
G. Martin, H. B. T., S. V. B., E. Harman, D. H., A. P. I., A. C. M. P., G. W., T. Lawrence, L. Hook, A. G., S. H., H. B., G. L.. F. C., D. W. J. H., C. P., J. S. W., C. V. Moore, E. T. Arnott, T. Skelton, W. Seaborn, A. E. B., A. W. K. L., A. S., D. L. S., A. E. V., W. G. W., A. W., M. C. W., J. J. C., A. W. D., L. Derisley, H. Morrish, A. J. Warne, W. A., R. W., J. B. B., W. Guezelin, G. R. Lent, J. W. Mostyn, S. H. Crow, C. A. Crow, J. A. Symyons, A. N. Other, H. J. H., P. S. Beddoes, O. W. M., S. S. Works, C. A. Whiton, K. T. Adams, D. Coles, F. Goodacre, G. Royle, F. A. C.—1s. each (55)	2	15	0
C. J. Johnson, A. Sparrow, A. E. Cartledge, H. B., C. H. D., R. D., B. W., A. J. F., G. H. T., P. H., J. B., A. B., H. O., T. J. F., W. Barnes and A. Francis (two Boy Scouts), R. Rowles, G. Warter—6d. each (17)	0	8	6
Total	£98	14	0

The Trans-Andean Flight.

Writing from Argentina, Mr. Jack England says that the French aviator, Marcel Paillette, left for Mendoza recently, intending to give exhibitions there and at San Rafael and Lujan. While at Mendoza Paillette was to endeavour to select a crossing point in the Andes range for a flight into Chili. If found practicable he will send to France for a 140-h.p. motor, the engine he uses at present being only of 50 h.p. In order to determine the route Paillette intended to cross the range from Mendoza in a motor car.

The Week's Work.

Bad Weather but Busy Times—Preparations for Work Again—Lieut. Parke, R.N., Working "Knocker-up"—Capt. Broke-Smith and Mr. Sopwith's Peaceful Bomb-Dropping—Plain—M. Prier's Storm-Flight.

Monday, March 18th.

Brooklands.—At Bristol School, Mr. Merriam testing, but too windy for pupils. Mr. Pizey also for several circuits solos.

At Sopwith School, Mr. Young out with Mr. Raynham on school Wright.

At Vickers School, Mr. Macdonald on latest monoplane out testing with M. Palassy as passenger. Trying to dodge sewage farm, turned sharp and touched wing-tip, bounced on to other and turned over, fortunately without damaging anyone. By strenuous work machine repaired in a few days.

At Avro School, Lieut. Parke, R.N., testing new 60-h.p. E.N.V. Military Avro, very fast. Landed with following wind, knocked hole in fence with propeller and front skid, only damage to propeller.

At Deperdussin School, Mr. Petre and Signor Sabelli each for a circuit, but too windy for pupils. Both again out testing propellers in evening. Lieut. Chinnery and Mr. Gill each doing straights.

Hendon.—At W. H. Ewen School, Mr. T. S. Apcar started course and had first lesson. Weather not favourable for much outdoor work.

Liverpool Aviation School.—Mr. Melly had out two-seater and flew to Crosby and back with Mr. Hardman (his pupil) as passenger, machine going perfectly. The school machine still delayed for want of cylinder, but it will probably be out early next week. Mr. Edward Birch, a well-known racing motor cyclist, has now joined. Has already been frequently a passenger in two-seater, notably round Formby and back, 17 or 18 miles, and to Manchester. Mr. Melly was piloting on both occasions.

Tuesday, March 19th.

Brooklands.—At Bristol School, Mr. Pizey on biplane testing. Then three circuits on monoplane, machine flying strongly. Mr. Lane then doing straights.

At Deperdussin School, Lieut. Chinnery out, but slightly damaged chassis and had to stop.

Hendon.—At Blériot School, Mr. Tremlett out early and was rewarded by being able to practise from 6 a.m. to 10.30 a.m., doing straights, then wind rose and no more work possible.

At W. H. Ewen School, Messrs. Baumann, Dubois, Ware, Apcar and Miss Prentice out for short spell.

The Plain (Bristol School).—Gale in morning, but in afternoon dropped somewhat. M. Jullerot and Mr. Hotchkiss up in steady wind of 20 m.p.h., latter getting into strongest remous he has experienced.

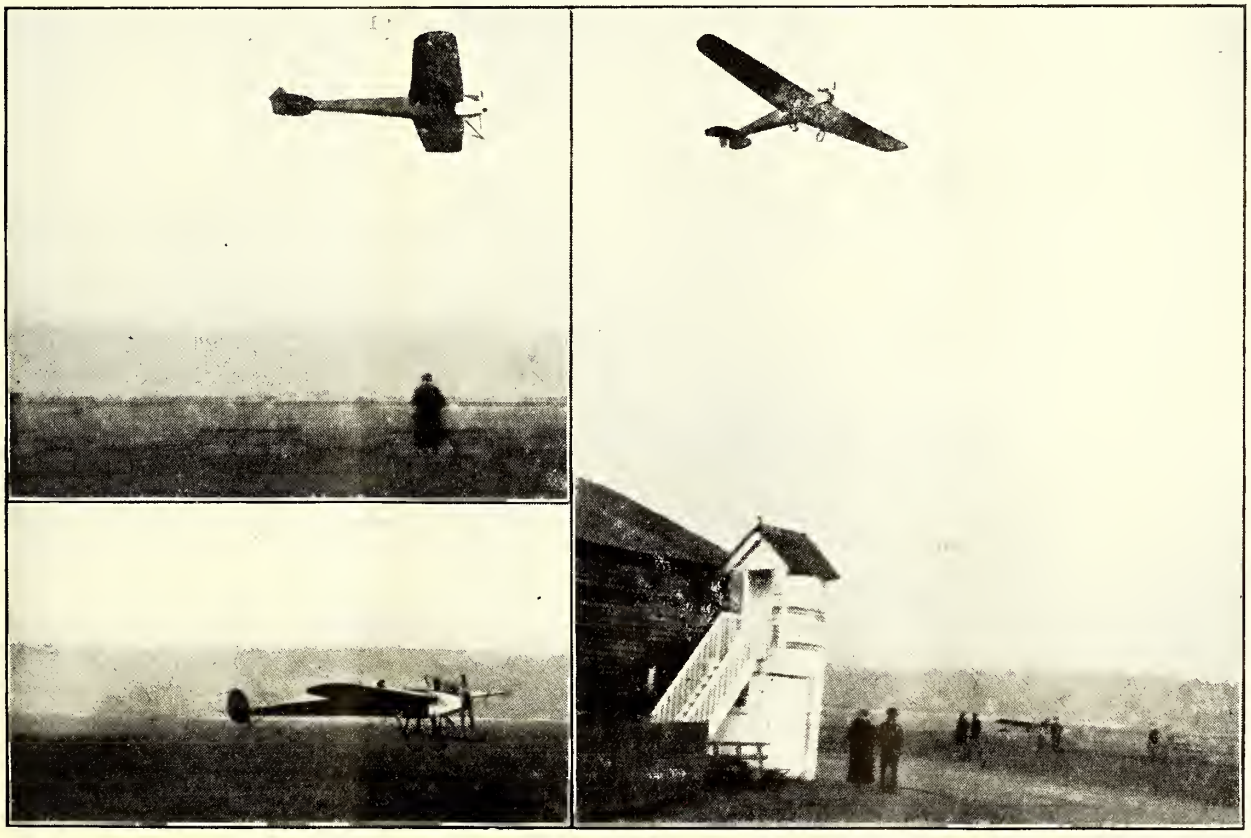
Wednesday, March 20th.

Brooklands.—At Bristol School, Mr. Merriam testing in gusty wind. Lieut. Fielding (new pupil) rolling. In evening Mr. Pizey on monoplane several circuits at 150 ft.

At Sopwith School, much passenger carrying by Mr. Raynham, taking up Mr. Young and Mr. Snowdon Hedley (new pupil). Later Mr. Sopwith on Wright with Mr. Handasyde and Mr. Spencer.

At Avro School, Lieut. Parke, R.N., early did first circuit on Military Avro, flying strongly. In evening out again and went up to 1,000 ft. by altimeter, climbing about 150 ft. per min.

At Deperdussin School, Mr. Petre out in evening, and Mr. Gill doing quarter turns at 30 ft. for short time.



Various views of the Flanders Monoplane taken a day or two before her final disintegration.

Hendon.—At Blériot School, M. Louis Aubert took first lesson on school machine and made excellent start, doing several straight lines along ground. M. Pothet doing straight flights low down and maintaining very even level. M. Teulade made debut as pupil and started promisingly. Mr. Clappen afterwards put in one straight before wind made work impossible.

The Plain (Air Battalion).—Lieut. Hynes out on *B.3.* testing engine, afterwards going for a 20 minutes' trip. Lieut. Barrington-Kennett out for two trips of 20 minutes each. Capt. Loraine went out on *F.4.*, and quickly rose to 700 ft., where wind was so bad that he had to descend. Anzani-engined Blériot arrived from Air-Craft Factory for "rolling" purposes.

The Plain (Bristol School).—Fifteen m.p.h. wind when Jullerot flew over Amesbury to wake pupils, afterwards racing their car back to sheds and dead heating. Lieut. Hall up with Jullerot for tuition, and Mr. Gordon England took up Mr. Montague Jennings (new pupil). First part of brevet passed in fine style by Lieut. Brodigan. Mr. Bendall up with Mr. Montague Jennings as passenger. M. Prier, on monoplane, made excellent flight at 1,200 ft., landing in spiral. Wind increased to 20 m.p.h. when Lieut. Brodigan went for second part of certificate and qualified with a plucky flight. Mr. Gordon England up with Mr. Dashwood Lang. Later, M. Prier out on monoplane, and Mr. Hotchkiss took Mr. Montague Jennings. M. Jullerot out on two-seater monoplane. Mr. England with Lang as passenger, and Mr. Hotchkiss with Mr. Montague Jennings.

Thursday, March 21st.

Brooklands.—No flying. Wet and windy.

The Plain (Air Battalion).—No flying. Vickers' "all steel" monoplane arrived for Capt. Sykes to compete in Mortimer-Singer competition.

Friday, March 22nd.

Brooklands.—At Bristol School, Mr. Pizey testing with Lieut. Mackworth (new pupil) as passenger; wind very bad. In evening Mr. Pizey up on monoplane, Mr. Merriam on biplane with Mr. Mackworth as passenger, and latter up with Mr. Pizey also. Mr. Lane flying straights on monoplane. Captain Broke-Smith, R.E., Adjutant and Instructor Air Battalion, doing straight flights very neatly. Mr. Pizey giving tuition to Major Sir Alexander Bannerman, Bart, R.E., Commandant Air Battalion.

At Sopwith School, over an hour's flying by Mr. Raynham giving lessons to Messrs. Hedley and Young. Mr. Sopwith also up with Mr. Hedley. Mr. Sopwith also up on Blériot with Mr. Pizey as passenger. While testing Wright in morning Mr. Raynham did splendid glide with engine shut off from 1,500 ft.

At Avro School, Lieut. Parke, R.N., on Military Avro, in morning took up Mr. "Rama" Smith to test weight-carrying, machine lifting well, but landing in bumpy wind, broke propeller and two front struts. In evening out again for circuits.

At Deperdussin School, Mr. Petre for a couple of circuits, Mr. Gill straights, Signor Sabelli three circuits.

The Plain (Bristol School).—In evening improved weather, and M. Prier out on monoplane. Mr. Gordon England on *No. 55* with Lieut. Ercole, finishing with usual spiral glide for instruction of pupil. Commander Schwann flew a circuit, and M. Jullerot out on monoplane to test new propeller. Machine rose quickly, and M. Jullerot was flying till after dark, making good landing, though not possible to see ground.

Saturday, March 23rd.

Brooklands.—At Bristol School, Mr. Merriam giving tuition to Lieut. Mackworth, and then latter with Mr. Pizey, taking control of machine at 400 ft. Later Mr. Pizey, on Anzani-Bristol monoplane, up at 500 ft., gliding down with engine stopped. Captain Broke-Smith, R.E., on biplane did two circuits in good style at 100 ft. to 120 ft., Major Sir Alexander Bannerman then doing four good straight flights. Mr. Pizey again doing glides on monoplane, and Capt. Broke-Smith four more circuits on biplane. Mr. Merriam giving instruction to Lieut. Fielding. Major Sir Alexander Bannerman did two really nice circuits. Mr. Pizey up teaching Mr. Mackworth. Capt. Broke-Smith then distinguished himself by doing three figures of 8 in excellent form. Later in evening Mr. Pizey out on monoplane and Mr. Fleming on biplane, Mr. Merriam teaching. Still more flying by Lieut. Fielding and other pupils.

At Sopwith School, Mr. Raynham hard at work for over an hour with pupils, Messrs. Hedley, Young, and Howard Wright, during brief fine period. No opportunity ever lost at this school. Mr. Sopwith also up for 35 minutes giving instruction to Mr. Howard Wright. Incidentally, Mr. Sopwith, having received invitation to lunch near Byfleet, attached acceptance to an orange, flew over to friend's house, flew round garden to attract attention, and then passenger dropped peaceful bomb with accuracy and address, afterwards returning to aerodrome and resuming tuition.

Lieut. S. C. Winfield-Smith, one of the latest Bristol Pilots.

At Avro School, in evening Lieut. Parke, R.N., on Military Avro, up to 500 ft. to test air. Landed to take up passenger. Mr. A. V. Roe, doubting power of machine, Lieut. Parke went up to 1,000 ft in 6 minutes, landing with spiral glide. He then took up Mr. Charteris, of A.B.C. Engine, as passenger, and went up to 300 ft., when engine stopped with choked petrol supply. Took him up again and climbed to 2,000 ft. in 13 minutes, disappearing in clouds. Descended in steep spiral with engine stopped, and on landing was baulked by another machine and nearly went into river. Very fine performance on part of machine and pilot.

At Deperdussin School, Mr. Petre a circuit early; Mr. Gill a straight at 40 ft. and then broke exhaust spring. In evening Mr. Petre circuits on racer, and a circuit on brevêt machine.

Brighton-Shoreham.—Mr. England brought out C.-E. biplane and continued trials, rising from ground quickly, and did one or two good straights. Machine should soon render good account of itself, as it appears to be a good flier.

Eastbourne.—Gale and rain all week. Lieut. Lawrence out on Blackburn made very pretty short flights in morning. Out again in afternoon, after two circuits came down too steep, machine turned right over, broke fuselage in three places, smashed wings; in fact, a very complete wreck. Mr. Lawrence only bruised.

Hendon.—At Blériot School, M. Salmet, school instructor, took Mr. Allen's 50-h.p. Blériot out during half hour's lull in wind, for final test prior to delivery to new owner.

No outside work at W. H. Ewen School. Lieuts. Pennycuick and Kerrich, two new Army pupils, joined school and had first instruction in controls.

Although very foggy, Mr. Fowler had Grahame-White biplane *No. 2.* brought out and put in half an hour's work at circuits. Mr. Manton out rolling on Grahame-White biplane *No. 3.* Mr. Lewis Turner out on Grahame-White biplane *No. 2* making circuits, followed by Messrs. Fowler and Biard, both flying circuits on the same machine. Mr Turner also out on Grahame-White monoplane *No. 4.*, making straight flights.

The Plain (Bristol School).—M. Jullerot, after testing, busy with Lieut. Hall, Lieut. Ercole, Mr. Lang and Colonel Smeaton as passengers; Lieut. Ercole also up with Mr. Gordon England. Mr. Bendall, with Mr. Montague Jennings as passenger; at same time M. Prier out on monoplane with Lieut. Bower, R.N., as passenger; and three daring flights made by Lieut Antonini on one of school monoplanes, pupil doing sharp bankings, and landing perfectly. Commander

Schwann up on *No. 66* in good style for just over three-quarters of an hour, and afterwards another 15 minutes, rising to 1,000 ft., and gliding from 300 ft. with engine shut off. Now quite ready for certificate. Colonel Smeaton, now learning monoplane, flew biplane *No. 43* to "feel his feet," for 15 minutes. Altogether splendid morning's work. Towards the evening Lieut. Bower, R.N., out on monoplane. M. Jullerot also out on another two-seater monoplane. Mr. Gordon England up with Mr. Montague Jennings, and afterwards alone. Mr. Montague up with Mr. Hotchkiss on biplane, as also Lieut. Hall, latter in control. Lieut. Antonini up for 15 minutes, and Lieut. Wyness-Stuart out for same duration.

Sunday, March 24th.

Brooklands.—Beautiful sunny day with strong wind, so no flying till late afternoon, when wind dropped a little, though still very gusty. First out Lieut. Parke, R.N., on E.N.V.-Avro, up to 1,000 ft., flying splendidly, and on descending reported strong but steady wind above 200 ft. Mr. T. O. M. Sopwith out at same time on Wright, finding it very bumpy. Mr. Pizey soon after up on Bristol monoplane, flying very cleverly, though much tossed about, but came down after two laps with engine trouble. Then went up on Bristol School biplane with passenger.

Mr. Raynham later out on Sopwith School Wright with Mr. Hedley as passenger, and afterwards Mr. Sopwith on same with a lady passenger. Signor Sabelli flying capitally at 100 ft. on little Deperdussin racer, and Lieut. Parke, R.N., out again doing more brilliant flying on E.N.V.-Avro. Altogether very pretty show for very bad day. Unless this Avro develops some unforeseen defect it seems likely to be one of the most successful machines yet built, and it is obviously highly efficient, as it does well over 60 m.p.h., and is only beaten by one or two very fast monoplanes.

In Percival shed, Mr. Muller very busy rebuilding biplane for Easter Meeting, and making very good job of it with help of local carpenter.

At A.B.C. works several big-powered engines coming through for military trials' machines. Design of new engine highly approved by most captious critics, and looks like being a really good thing which will help to refute statements inspired from interested quarters that we have no engine-builders in this country.

Hendon.—Mr. Grahame-White out new Grahame-White biplane *No. 5.* testing ailerons, which were still, however, too sensitive, and machine consequently returned to works; and Mr. Grahame-White then had out biplane *No. 2.*, first flying circuit to test weather and afterwards making exhibition flights, landing with splendid spiral *vol plané*.

The Plain (Air Battalion).—Capt. Loraine arrived with Mr. Robert Loraine's 70-h.p. Nieuport, with intention of competing for Mortimer Singer.

The Plain (Bristol School).—Wind fully 35 m.p.h., and all thought of school work abandoned. Nothing daunted, M. Prier had one of Bristol two-seater monoplanes brought out. Machine perfectly stable, and M. Prier made one of his finest flights, doing two circuits and making graceful landing. Great admiration expressed by crowd at wonderful stability of Bristol monoplane in such a wind.

REGULATIONS FOR PREVENTING COLLISIONS IN THE AIR.

The Royal Aero Club has drawn up the following regulations for preventing collisions in the air :—

Cross-Country Flying.—(*a*) Two aircraft meeting each other end on, and thereby running the risk of a collision, must always steer to the right. They must, in addition to this, pass at a distance of at least 100 metres taken between their nearest adjacent points.

(*b*) Any aircraft overtaking another aircraft is responsible for keeping clear, and must not approach within 100 metres on the right or 300 metres on the left of the overtaken aircraft, and must must not pass directly underneath or over such overtaken aircraft.

The distance shall be taken between the nearest adjacent points of the respective aircraft. In no case must the overtaking aircraft turn in across the bows of the other aircraft after passing it so as to foul it in any way.

(*c*) When any aircraft are approaching one another in cross directions, then the aircraft that sees another aircraft on its right-hand forward quadrant* must give way, and the other aircraft must keep on its course at the same level till both are well clear.

Exception.—In the case of dirigibles the distance of 100 metres prescribed above shall be increased to 500 metres.

Flying Grounds.—The following special regulations apply only to flying grounds :—

(*d*) Two aircraft meeting each other end on, and thereby running the risk of a collision, must always steer to the right. They must, in addition to this, pass at a distance of at least 30 metres taken between their nearest adjacent points.

(*e*) Any aircraft overtaking another aircraft is responsible for keeping clear, and must pass outside the overtaken craft at least a clear 30 metres distance. In no case must the overtaking aircraft turn in across the bows of the other aircraft after passing it so as to foul it in any way. The distance shall be taken between the nearest adjacent points of the aircraft.

In these regulations the term " foul " shall include the giving of dangerous backdraught to another aircraft.

* From 0 degrees (*i.e.*, straight ahead) to 90 degrees on the right hand constitutes the right-hand forward quadrant.

THE BRITISH EMPIRE MICHELIN CUP No. I.

(Under the Competition Rules of the Royal Aero Club.)

The Michelin Tyre Company has presented to the Royal Aero Club of the United Kingdom, for competition by British aviators, a trophy of the total value of £500.

Annually, for five years, a replica of this trophy, together with a sum of £500 in cash, will be given to the successful competitor. This trophy will be competed for under the following conditions, which shall apply for this year only :—

Conditions.—(1) The winner for the year 1912 shall be the competitor who, on or before October 31st, 1912, shall have remained the longest time in the air in an aeroplane in one flight without touching the ground. The flights may only be made between the hours of sunrise and one hour after sunset, and in order to qualify for the prize the competitor must make a continuous flight of at least five hours.

(2) Competitors may use any recognised flying ground in the British Isles, and all attempts must be made in the presence of the official or officials appointed by the Royal Aero Club.

(3) Competitors desiring to leave the precincts of the flying ground during the flight must carry a barograph set and sealed by the officials prior to the start.

(4) The time will be reckoned from the moment of crossing over the starting line in actual flight to the moment of alighting. The landing must be in sight of the official or officials.

(5) The entrant, who must be the person operating the machine, must be a British subject, flying on a British-made aeroplane, must hold an aviator's certificate, and must be duly entered on the competitors' register of the Royal Aero Club.

(6) The complete machine, and all its parts, must have been entirely constructed within the confines of the British Empire, but this provision shall not be held to apply to raw material.

(7) An entrance fee of £1 must accompany every notification of an attempt, and at least three clear days' notice must be given to the Secretary, Royal Aero Club, 166, Piccadilly, London, W. A competitor must further deposit a sum of £10 on account of expenses, if any, of officials. Any balance not so expended will be returned to the competitor.

The Royal Aero Club.

At the committee meeting on the 19th inst. the following new members were elected :—C. L. Embiricos and Lieutenant Henry Crossley Fielding.

The following aviator's certificate was granted :—(168) George Prensiel (Blériot, Hendon). Subject to permission of German Aero Club.

The competition rules of the Royal Aero Club, as drafted by the Competitions Committee, were finally approved.

The chairman reported to the committee the proceedings at the Conference of the Fédération Aéronautique Internationale, held in Paris on the 15th and 16th inst.

The Conference considered the proposed new international rules of the Fédération, which are to be confirmed at the Vienna Conference in June next. The suggestion of the Royal Aero Club that aviators' certificates should be issued in respect of flights made on hydro-aeroplanes under the existing rules was adopted, pending special regulations to be approved at the Vienna Conference in June next.

A letter has been received from the Home Office intimating that his Majesty the King has been graciously pleased to grant permission to the members of the Royal Aero Club to fly on their aircraft a burgee bearing a representation of his Majesty, and surmounted by a royal crown.

Correspondence.

The Editor of The Aeroplane *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* The Aeroplane, 166, *Piccadilly, W.*

An Appreciation of Mr. D. G. Gilmour.

Sir,—As a reader of The Aeroplane from the first number, I should like to thank you for your sympathetic "In Memoriam" article on Mr. Graham Gilmour and his most sad death. In it you have voiced most admirably what must be the feelings of everyone who had the privilege of knowing Mr. Gilmour.

All who are interested in aviation must indeed mourn the loss both of his bright personality and of his valuable services to the science of aviation.

I have had the pleasure of taking two flights with him, and have often enjoyed a chat with him on my visits to Brooklands, and I have felt his death as a personal loss. I grieve to think what it must mean to his relatives and intimate friends.

He was a brave man, and I, for one, feel proud to have known him.

Peckham. Bessie S. Bowker.

Mr. Graham Gilmour's Death.

Sir,—The terrible accident which befel poor Mr. Gilmour on February 17th has thrown the whole of aviation circles into mourning. The ill-fated aviator was so popular and so daring that he endeared himself to all who knew him. An accident such as this does a great deal of harm to aviation by raising the prejudice of bigoted persons against flying. Living in Richmond, I have heard on every side condemnations of flying, and the general idea of the public was that aviation should be prohibited by law. Can nothing be done to destroy this bigoted idea?

I witnessed Mr. Gilmour's fall, and it appears to me that if the machine had been thoroughly examined for weak parts it would not have occurred. I am of the opinion that an aviation board of experts should periodically examine every aeroplane in use and condemn any weak part which would be likely to cause disaster. The accident was clearly caused by the wing breaking under the extra strain placed upon it, and considering it had been flown in a snowstorm and used many times before, I think it should have been thoroughly examined for weak parts before Mr. Gilmour ventured upon it.

Richmond, S.W. Jeremiah Jenkins.

[This letter is published merely to give one view of the question. As a matter of fact, no machine was ever so carefully examined as Mr. Gilmour's, and few if any machines were so strongly designed and made. Perhaps Mr. Jenkins was among those who, in examining the wreckage, mistook the "tacky" wing varnish on the woodwork for half-dried glue. The spar of the wing which broke is calculated to be strong enough to stand its work without stay-wires.—Ed., The Aeroplane.]

The French Parachutist's Fate.

Sir,—It is not with any authority, scientific or otherwise, that I write to your excellent journal, but because I feel justified as a regular though humble reader to proffer an opinion in regard to the horrible fate of the French parachutist, who met with an untimely end a few weeks ago.

I think I am right in asserting that no parachute extant opens under a fall of a few hundred feet, so taking this into consideration I am inclined to regard the brave inventor as a little foolhardy, though, of course, I do not in any way deprecate his splendid daring. The parachute under discussion would have stood a far better chance if the unfortunate man had ascended to the last stage of the great Eiffel Tower, some 950 ft. above the ground, and he might have come safely and gently to earth.

I witnessed a kinematograph film some weeks back which depicted the experiment. The film opened with a series of photographs of the intrepid little Frenchman attired in his *robe de vol.* Everything being ready, he made his way boldly to the first stage of the Tower in order to test the capabilities of the weird contrivance. Despite the entreaties of a group of people, he arrived at the starting point. Here, however, he appeared to hesitate, as if he had not sufficient confidence, but satisfying himself as to the "hood's" correct position on his person, he dropped from the platform to the earth beneath. At this point the film "shut off," thus relieving the audience from a fearful tension. For my own part I was more than thankful.

Although the inventor was daily engaged with a prospering business in the French capital, he had at all times the interests of aeronautics at heart. He died in the act of doing his little best towards the furtherance of an industry that has before it a great future. Leslie H. Harris.

Mr. Weiss on Resistances.

Sir,—The theory advanced by Mr. José Weiss (in his interesting article recently in The Aeroplane) re the lesser resistance of large bodies for aeroplanes is so startling that I think you might invite some other expert opinion about it. If this theory is correct there must be some reason for it, and it should not be impossible to discover it: probably tests in a wind tunnel would settle the matter beyond doubt.

With all due respect to Mr. Weiss, I am inclined to think that his tests were at fault—probably the different bodies tried on his model altered the balance (centre of gravity and centre of resistance), so that the larger body flew at a more favourable angle than the smaller one; this would make all the difference in their performances.

The Nieuport body is good because it encloses everything that increases head resistance, including the pilot's body; but I should expect a smaller body, that fulfilled these conditions, to be easier to drive through the air. A very small body which leaves the pilot exposed to head resistance probably causes much more resistance than a good streamline body that is too large for its purpose of completely enclosing all resistance producers.

London, E.C. Leo Jezzi.

Release Gears.

Sir,—Looking through one of your back numbers (January 18th), I am interested to read your remarks in connection with the War Office competition, especially in connection with the securing of machines so that the pilot can with safety start the engine and run it up to full power before letting go.

I fitted a release to my two-seater Blériot in May last, and have had it in constant use ever since, and I may say that the only accident I have met with was solely due to the fact that I started up without using the release attachment, and the machine had to run fully twice as far on the ground before the engine got into its stride.

If only aviators would realise the great advantage of being able to tune their engines until they are satisfied that they are in perfect running order, without having a lot of mechanics to hold them back, they would never be without such an attachment again. The whole contrivance weighs little over 1 lb., and there is practically no machine built on which my release could not be safely employed.

Henry G. Melly.

Waterloo (Liverpool).

The Fate of a Pioneer.

Sir,—Can you let me know, through the medium of your valuable paper, whether M. Santos Dumont is still in the land of the living?

I cannot persuade a chum that he still lives, and if he sees it in an official paper he may believe.

N. H. Dannatt.

[M. Santos Dumont was very much alive when last heard of. He has been lately devoting his time to the improvement of car engines.—Ed.]

The Retort Courteous.

Sir,—Mr. Holt Thomas's attention has been called to your article in The Aeroplane, and I am desired to say that although he has closely followed aviation since 1906, he lays no claim to being a "pioneer," and that your attack on him would, with more reason, be diverted to the Editor of the *Daily Express*, who thus referred to him. Nor, although quite willing to be of service, can he lay any claim to the honour of persuading the War Office to any action.

M. E. Trench (Sec.).

[Mr. Holt Thomas's modesty is eminently becoming, and the Editor regrets that his gentle remarks should have been regarded as an "attack." However, as Mr. Holt Thomas was so successful in selling foreign aeroplanes to the Government *without* persuasion, let us hope he will use all his persuasive influence ere long to induce the War Office to purchase modern and safe machines of wholly British origin.—Ed.]

Nomenclature.

Sir,—As the nomenclature of aviation is still in an unsettled condition, it may not be too late to make the following suggestions :—

(1) That the biplanes now variously called "Avro type," "Bréguet type," "engine-in-front type," etc., should be called "fuselage" biplanes.

(2) That the biplanes on which the tail and forward elevator (if any) are carried on "outriggers," usually called called "engine-behind type," should be called "outrigger" biplanes.

(3) That the name "aquaplane" should be substituted for "hydro-aeroplane," now commonly used for aircraft capable of alighting on water.

S.W. C. Nicholson.

[Mr. Nicholson's suggestions are worthy of consideration, but I fear they come too late. The type of machine to which he first refers is now almost invariably known as a "Tractor Biplane"; while the second has, with intention and with unholy appositeness, been given the name of "Box-Kite." The third suggested name is not very good. "Aquaplane" means, as does "Hydroplane," a "*water*-plane," and this while quite applicable to a type of boat, has nothing to do with an aeroplane, even if the latter is fitted with hydro-planes. The proper name is, of course, "Hydro-aeroplane." This being awkward and ugly, I would suggest "Marine Aeroplane," or "Marine 'Plane." I have been promptly told that this is not applicable to lake and river machines: strictly speaking, this is so, but we have, at any rate, a precedent in the terms "Marine Engine," "Marine Boiler," etc.—P. K. T.]

Head Resistance and Propeller Slip.

Sir,—In your article, in a recent issue, on "Busy Eastchurch," you state that Mr. Ogilvie has reduced the head resistance considerably to his Wright machine, and that the "peculiarity is that, though the machine flies faster, the same propellers and gearing are used, and yet the engine shows hardly any increase in its revolutions."

May I suggest that this peculiarity is only an answer to the reduction of head resistance—in other words, decreased head resistance means decreased propeller slip? The propeller, under these changed conditions, might attain even a lower number of R.P.M., but have a more positive thrust.

Peculiarly enough, with ships' propellers, a little slip means a large waste of power. D. Gratton Reston.

Dulwich.

A Propeller Problem.

Sir,—With reference to your very interesting article "Busy Eastchurch," I notice you mention that propeller theory is not helped by the fact that on the Short tandem twin the tractor has a larger pitch and diameter than the propeller. I beg to offer the following simple explanation of this phenomenon.

It is well known that the air in the slip stream from a screw travels in a spiral path. Since the tractor and propeller are running in opposite directions, it follows that the propeller works in a column of air rotating in a direction opposite to the direction of rotation of the propeller. In this way the propeller works virtually faster than the engine, so that for an engine speed equal to that of the leading engine the pitch and diameter may be reduced without affecting the thrust.

Bedford Park. S. C. Shepley-Part.

Lessons from the Gulls.

Sir,—As a keen student of aviation and everything connected therewith, I have spent a considerable amount of time in observing the actions of gulls in flying and soaring, and I hope that by writing out the results of these observations I may give some assistance to those who are interested in bird flight, but who have not had equally good opportunities of watching these graceful and clever birds at very close quarters.

The first thing that impresses one about the gull is his particularly clean outline and absence of ragged or untidy plumage, and I think his excellent soaring capabilities may be largely ascribed to the complete elimination of unnecessary head resistance.

Watching gulls in motion about a vessel having a high superstructure, their preference for the weather side, where there is a strong upward air current, is very marked (this being most noticeable when the vessel is at anchor—at sea they generally follow the ship), and here they will glide backwards and forwards, without other motion of their wings than those required for purposes of control, while the lee side, where there is only a weak upward air current (caused by what sailors call "back draught"), or at times none, will be almost deserted. Once out of this upward current, however, wing-flapping has to be resorted to, and, though they can glide for remarkable distances, it is very evident that they cannot sustain their position in the air outside its area.

An endeavour to determine the form of a gull's wing resulted in the conclusion that the form of the wing is altered to suit the requirements of the moment, and that it has no definite permanent shape. In a strong or unsteady wind the wings are curved downwards, and bent backwards at the tips, while in a light wind they are spread out to their fullest extent and flattened as much as possible.

Being under the impression that gulls use the shape commencing with a dihedral angle at the body and curving downwards towards the tips for the purpose of obtaining natural lateral stability, I tested this shape of wings on a small rubber-driven model, and was very soon undeceived, for I found this model to be particularly "tender" (to use a nautical expression), evincing a strong tendency to capsize at the least alteration of one or other wing tip. From this I concluded that the gulls use this shape, more pronounced in strong or unsteady winds, for obtaining ease and quickness of control, this being of more importance to them than natural stability.

With regard to fore and aft stability, I concluded that gulls depend almost entirely on the upward turn of the extreme wing tips, and on alterations of the position of the centre of gravity by movements of the head and neck, and little or not at all on the tail, this member being tightly closed in long, straight flights or glides, and only expanded when turning, rising from the water, or alighting. The tail appears to be largely used in horizontal steering, however, by a twisting movement, putting it out of the same plane as that of the wings.

When soaring or gliding in light winds, with their wings fully spread out, gulls must be in a very unstable condition, but this can, with their perfect control, well afford to be, if by doing so they can reduce their head resistance.

Lieut. Wilfred Parke, R.N., just landing from one of his astonishing flights at Brooklands on Sunday last, on the new 60 h.p., E.N.V.-Avro, which he was tuning for the Mortimer Singer Prize.

In order to judge for myself the possibility of the ornithopter, I closely observed the action of the wings of gulls in flight, and found by watching gulls flying directly beneath me that there is a decided horizontal motion of the wings as well as the vertical motion, the combined result of these and the backward curve of the wing producing a circular motion at the wing tip that is very propeller-like.

This action would be very difficult to reproduce mechanically, and, taken with the many other difficulties in the way of the construction of the ornithopter, brought me to the conclusion that this type of flying-machine is quite impracticable. The action of the gulls' wings in flight would appear to be an argument in the favour of the use of large twin screws, which is well known to be the most economical method of propulsion, though for mechanical and constructional reasons not always the most practicable.

The lessons to be learnt from the gulls would appear to be—to reduce head resistance as much as possible, to fit the most powerful controls that can be arranged, to use large twin screws if the type of machine will permit, and to keep on flying in order to gain as much knowledge of the air as possible.

S. P. Elliott.

Liverpool.

Duties of Aviation Officers.

Sir,—The title of the standard handbook of warship types to which you refer is "Fighting Ships," and it has been officially issued for study to officers of the R.G.A. for years. As regards its accuracy—well, it is served out in every Navy in the world, and officially revised by most Admiralties.

With regard to my aviation annual on the same lines, "All the World's Airships" (in future the term "aircraft" will be substituted for "airships"), the inaccuracy of which you allege. In the great majority of cases details, etc., were supplied by the makers. The whole was revised by study of the entire aerial Press of the world, supplemented by specific revisions by certain well-known experts.

In the forthcoming edition, every nation is specially revised in its own country as an additional precaution. Of course, the work is not perfect, and is yet a long way behind my ideal. But I have certainly made every effort to secure accuracy, and think that your implication is hardly just or generous.

Fred T. Jane.

[Mr. Jane's courteous explanation of the defects in his book on air craft is the best earnest of improvements in his next volume, and the writer trusts that if The Aeroplane can be of service in this matter Mr. Jane will consider its stock of information as being at his disposal, always provided that he will not label the staff as "experts."—Ed.]

An Extraordinary Dirigible.

Sir,—In Monday's *Daily Mail* there appeared a description of a wonderful new dirigible, not American, but "made in Germany," which, it appears, travels 45 m.p.h. in a calm, and 25 m.p.h. against a 30 mile wind.

It is exceedingly annoying to be continually confronted with the successes of these German inventors in view of our own failures in the dirigible line, and our speed records are now completely put in the shade by this new machine. For a little calm reasoning will at once show that a vessel whose normal speed of 45 m.p.h. is increased by 10 m.p.h. when fighting an adverse 30 mile wind has great and glowing advantages over any other dirigible machine whatever, since it has only to choose a wind sufficiently adverse to be able to completely eclipse its own best speed records.

On the other hand, a machine that travels faster against the wind than it does in a calm must necessarily travel slower in a favourable wind than when there is no wind, and thus, if the wind was sufficiently favourable to blow it along at, say, 100 m.p.h. it would remain absolutely stationary. What are we to do against such an invention as this? Imagination boggles at the vista of its possibilities, and no one but a *Mail* expert dare contemplate them with calmness.

May I urge upon our inventors the necessity of at once evolving an aeroplane that will travel at a speed that shall increase in direct proportion to the decrease of the horse-power of the engine. This looks drastic, but it is necessary to grasp the nettle, and this is the only way in which to meet the German invention. With an aeroplane of this description it would be easy to overtake this dirigible, since the pilot could, by heaving the engine and propeller overboard to reduce the h.p., and drinking the contents of the petrol tank to lighten the machine, so increase his speed that even a *Daily Mail* dirigible would be unable to escape—unless it was assisted by a contrary wind of over 100 m.p.h., and these are fortunately scarce in this latitude.—Yours optimistically,

W. Le Maître.

Golf and Aviation.

Sir,—I am writing to bring to your notice an attempt by some golf clubs apparently to endanger the lives of any aviators who are compelled to land on their links. The following is an extract from the golf notes of one of our leading daily papers, incidentally one of the best informed as to flying generally.

After a little about aviators liking to land on greens, which is but natural, the writer says :—"So what some of the green committees are doing, as I am informed, is to set up high poles round about the putting greens and to connect them with a kind of cat's cradle of telegraph wires so that the aeronaut (*sic*) shall be discouraged from making descent on these temptingly smooth surfaces.

"I cannot say that I personally have seen any of these cat's cradles, but I always believe what I am told, and have no doubt they would effect their purpose perfectly of deterring the aeronaut from his contemplated descent, or, at least, of ensuring that he never should fly again if he persevered in it."

That last part is true, only too true. A golf links is one of the best places for a descent as long as it is not too infested with golfers and bunkers, but when these cat's cradles are put up, say, on the links round Brooklands, life for the aviator would not be worth living. He had much better cut his throat first before risking death or, at best, a bad accident if he should happen not to see one of these traps.

Aeroplanes will win or lose our next great war, while golf, to put it mildly, will not. I do not hate golf as some people do; I play as often as I can, but such remarks as those quoted above make me think that some people do not always think and act for the common good nowadays.

J. H. Brownrigg.

The late Mr. Gilmour's Accident.

Sir,—Knowing the reputation of The Aeroplane for outspoken comment and a fair hearing for all sides, I should like to express an opinion as to the cause of the fatal accident to Mr. Gilmour.

You say that "the cause of the accident will, of course, never be known, and one can only surmise that there must have been some undiscoverable flaw in the wood of one wing," though, as you further point out, "this seems almost impossible, seeing the size of the spars and the care with which Martin and Handasyde select their material."

These facts stand out clearly. They are :—

(1) Neither wing-tip showed any evidence of hitting the ground;

(2) All the wing wires were intact; and

(3) On the day of the accident curious atmospheric conditions prevailed.

The first two facts show that both wings broke away or folded back before the machine touched ground, and that that fact was not due to wire breakage. The third suggests that a contributory factor to the breaking of the wings was the additional stress caused by a drop consequent on an "air pocket."

The wings of the aeroplane formed a dihedral angle. What I suggest is that this dihedral angle was the other contributory factor.

It is obvious that, if a plane without a dihedral angle falls downward, the air resistance will be at a right angle to the whole plane. If, on the other hand, one imagines a plane with its wings sloped *upwards* to such an extent as to form a V, the air resistance would tend to force the wing tips to a point above the centre of the machine—that is, not only upwards, but *inwards*.

The resistance to a non-dihedral plane would be equal at all points of the plane, but it seems to me (for some reason which I am unable to explain) that the resistance to a plane forming a dihedral angle would be greater at the wing tips than at the centre of the machine. If this is so, then the resistance at the extremity of the wing would force the wing at the wing joints, as though the whole thing were a *lever*.

In ordinary circumstances the wing would be (as had been proved with the Handasyde) strong enough, but a remou such as was experienced by another aviator on the same day, who dropped about 200 ft., would provide the last straw and a margin, and this would especially be the case with an aeroplane of large span.

The Handasyde monoplane may be said to belong to the Antoinette type—a type which is characterised by the dihedral angle and the reverse of the compactness of the Blériot and

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Nieuport designs. The Blackburn monoplane also belongs to this type. It is a singular fact, and one which seems to bear out my contention, that the three outstanding examples of fatal accidents caused by the machine breaking in the air have all been with this type.

The first of the three I am thinking of is that in which a Continental aviator and his passenger were killed, in bad weather conditions, by one wing of the Antoinette breaking away completely, the machine falling in a spiral. The second is the Filey disaster, and the third, I submit, is this to Douglas Gilmour. In the first two, it seems to have been established that the wings broke away at the chassis. I submit that this is the only way the wings of Gilmour's machine could have broken.

Of the many aviation accidents, very few have been due to the machine breaking in the air. I am open to correction, but I think that the only recorded instances of fatal accidents through the wing or wings breaking away are those mentioned above to this type. The point I would like to emphasise is that the dihedral angle is a source of weakness, which is, in machines of the Antoinette type, accentuated by the large span.

GEE.

Wandsworth.

[This correspondent's theory, though almost certainly incorrect, is worthy of consideration, and suggests investigation of the peculiar strains set up by a sudden strain applied to the outer section of a wing built on the cantilever principle and set at a dihedral with the opposite wing.—ED.]

CLUB NOTICES.

Roan School Aero Club.—Fifteen members present at long distance competition on 19th. L. A. Liddon, 264 yds.; H. Walden, 120 yds.; H. F. Backhouse, 120 yds.; N. C. Saunders, 118 yds. Point-to-point competition: H. Knight, six flights. Greatest stability, A. M. Clarke's model.—J. H. PECKHAM, Hon. Sec., Eastney Street, Greenwich.

Paddington and Districts Aero Club (1910).—Result of inter-club contest: Ealing and Districts won with 35 3-5 secs. average against our 29 2-5 secs. C. Davies did 36 1-5 secs., C. Chilcott 35 3-5 secs., and L. Roche, 32 secs., for Ealing; H. Weston 38 1-5 secs., Lane 26 1-5 secs., and Chalfont 24 secs., for Paddington. Return contest will take place at Ealing in three weeks' time. Inter-club contest being arranged with Birmingham Aero Club. Committee passed rule that models in competitions shall not weigh less than 4 ozs. March 30th, juniors' and novices' competition for duration, four prizes, viz., 5s., 2s. 6d., and 2 pairs propellers. Easter arrangements.—Saturday, certificate flying; Monday, point-to-point contest.—W. E. EVANS, Hon. Sec., 133, Buchanan Gardens, College Park, Harlesden, N.W.

Reigate, Redhill and District Aero Club.—Lewis, Osborne, and Norton out Earlswood on Wednesday, Cox flying at Nutfield. Lewis, Norton, and Morris out on Saturday. The club is flying at the Southern Counties Band Contest on Easter Monday. Particulars of competition from Sec., H. V. MAY, 4, London Road, Reigate.

Brighton and District Aero Model Club.—Members are asked to make special effort to attend flying Saturday next at Shoreham. Competition for Mr. Townsend's two prizes open till end of Easter school vacations. Communications A. VON WICHMANN, Hon. Sec., "Kingsleigh," Kingsway, Hove.

Ealing and District Aero Club.—Contest v. Paddington Ae.C., Saturday, Messrs. L. Roche, C. Davies, C. Chilcott and C. Roche represented club, and won with average of 34 3-5 secs., to Paddington Ae.C.'s 29 1-5 secs. On Sunday, L. Roche, L. Kirchner, and Beeching flying. At general meeting on 20th, benefits of affiliation to Kite and Model Ae. Association put before members. Rules for certificates passed as follows:—1st Class—Severe theoretical test by examiners appointed by committee, and practical test 440 yds. distance and 60 secs.' duration. 2nd Class.—Elementary theoretical test and practical test 250 yds. distance and 30 secs.' duration. Theoretical test to be passed before practical, and 2nd Class before 1st Class. To cover cost of certificate, etc., fee of 6d., 1st Class, and 3d., 2nd Class, payable at each attempt, will be charged.—B. J. KIRCHNER, Hon. Sec.

Coventry Aeroplane Building Society.—Exhibition, Corn Exchange, Saturday, March 30th, to be opened by Mayor of Coventry, supported by Rear-Admiral Bacon and others. Good show of models, including 5 petrol-driven models, 2 Humber engines, parts of full-sized machines, and other interesting exhibits. Birmingham Aero Club are sending interesting models. Shall be glad to receive exhibits. On Easter Monday Birmingham Aero Club visit Coventry with team of model fliers in Green's Field, Allsley Road, at 2.30.—J. W. SCHOFIELD, Sec., 22, Kingston Road, Earlsdon.

Birmingham Aero Club.—At Billesley Farm, Messrs. Trykle, Wood, W. Lunn, Rogers, G. Wilde and G. Mason flying. Next monthly meeting at Bell Inn, Phillips Street, April 1st, 8 p.m. Non-members invited. Next quarter's subscriptions due April 1st. Competition for two pairs of 9 in. Willis propellers. Particulars from the secretaries.—G. HADDON WOOD, Joint Hon. Sec., 8, Frederick Road, Edgbaston.

Blackheath Aero Club.—At Lee, Messrs. Bailey, A. Jarvis and H. H. Pizey flying. Will members note flying at Kidbrook ground terminates with next Saturday's meeting. Flying next week-end at Kidbrook, Lee, Grove Park, Crofton Park, and Blackheath.—A. E. WOOLLARD, Hon. Sec.

Bristol Model Flying.—No model flying meeting March 30th. On April 3rd, informal meeting, Clifton Down Hotel (by permission of Bristol Aero Club), at 8 p.m. Arrangements will be made for forthcoming meetings and competitions. All interested asked to come. Meeting at Sea Walls April 6th, at 3 p.m.—R. V. TIVY, Hon. Sec., 3, Royal York Crescent, Clifton, Bristol.

Hackney and District Aero Club.—Meeting, Saturday, Spensley Hall. Experiments carried out after dark by means of sparklers. Next meeting, Spensley Hall, April 12th. Members are also asked to specially reserve this date as committee elections take place.—BRUCE H. LONGSTAFFE, Hon. Sec., 47, Jenner Road, Stoke Newington, N.

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GOOD FRIDAY, SATURDAY, & EASTER MONDAY

APRIL 5th, 6th and 8th,

To be held at

THE LONDON AERODROME, HENDON, N.W

(weather permitting).

SUMMARY OF EVENTS:

FRIDAY, APRIL 5th.

2.30—3.30 p m. PARADE OF AEROPLANES AND EXHIBITION FLIGHTS.
3.30—4.30 p.m. LONDON AERODROME 3-DAYS' GRAND SPEED CONTEST.
4.30 5.30 p m. FAST AND SLOW PASSENGER-CARRYING CONTEST.
5.30 - 6.15 p.m. ALTITUDE CONTEST.

SATURDAY, APRIL 6th.

2.30—3 30 p.m. PARADE OF AEROPLANES AND EXHIBITION FLIGHTS.
3.30—4.30 p.m. FIGURE EIGHT SPEED CONTEST.
4.30—5.30 p.m. LONDON AERODROME 3-DAYS' GRAND SPEED CONTEST.
5.30—6.15 p.m. MONOPLANE HANDICAP SPEED CONTEST.

EASTER MONDAY, APRIL 8th.

12.0—1.30 p.m. PARADE OF AEROPLANES AND EXHIBITION FLIGHTS.
1.30—2.30 p.m. BIPLANE HANDICAP SPEED CONTEST.
2.30—3 30 p.m. LONDON AERODROME 3-DAYS' GRAND SPEED CONTEST.
3 30—4.30 p.m. CROSS COUNTRY HANDICAP RACE, HENDON—ST. ALBANS—HENDON.
4.30 - 5.30 p.m. RELAY RACE: BIPLANES AND MONOPLANES IN PAIRS.
5.30 - 6.15 p.m. ALTITUDE PASSENGER-CARRYING CONTEST.
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MOTOR CARS - 2/6.

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THE AEROPLANE

1D WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

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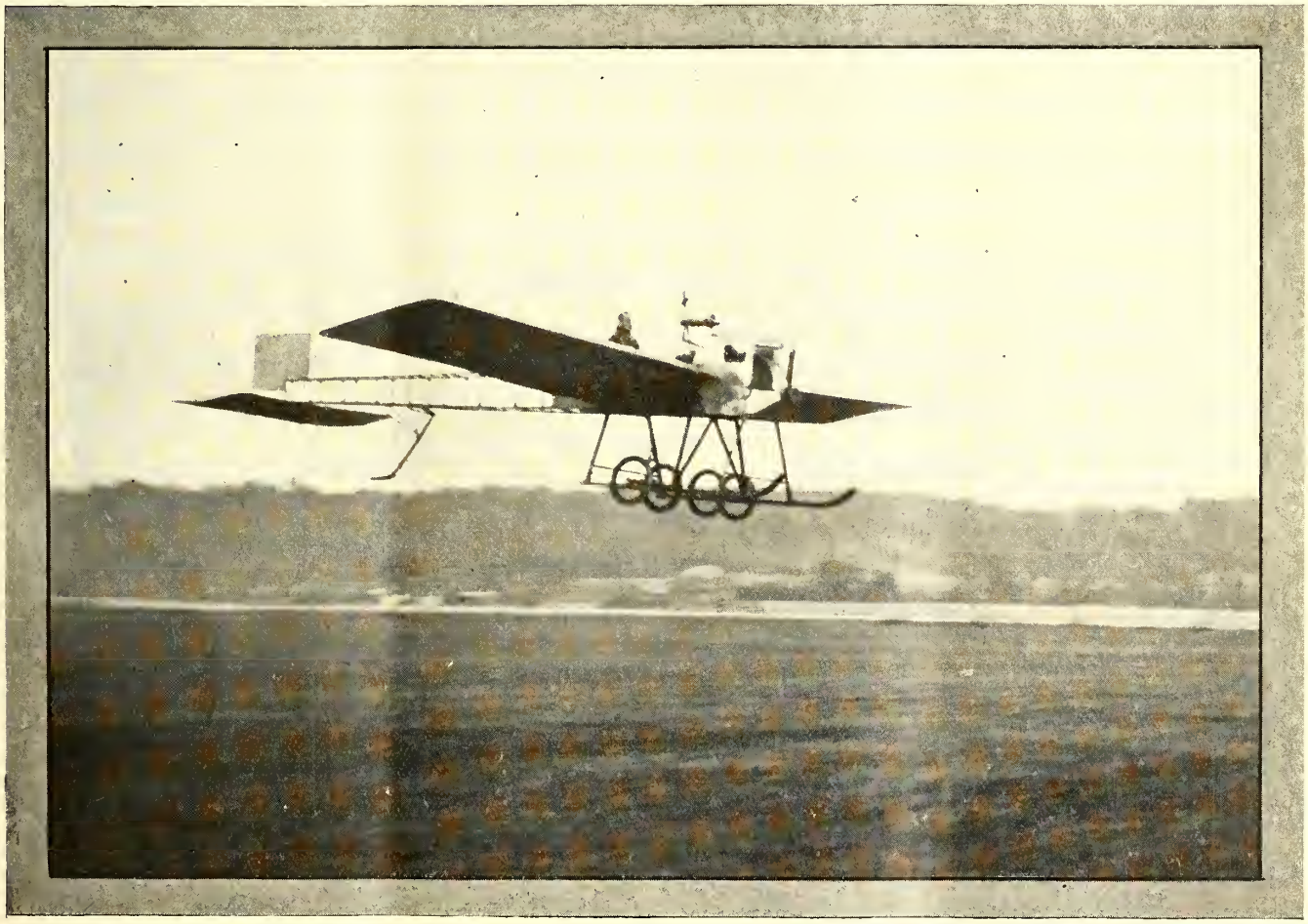
A RESURRECTION.



On Sunday last the two-year-old Howard Wright Monoplane of the Sopwith School was brought out by Mr. Ronald Charteris, after being fitted with a 40-H.P. A.B.C. engine. Though the engine was untuned the machine showed that it could fly quite well. Its general design proves how far advanced British designers were two years ago and how far ahead we might have been if we had had proper support from the authorities.

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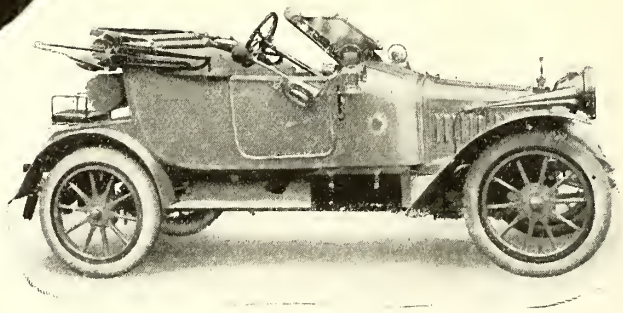

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MATTERS OF MOMENT.

AN EXPLANATION AND SOME SUGGESTIONS.

The Aeroplane has been of late somewhat severely taken to task by certain of its readers on account of its frequent criticisms of the way in which the Government is treating the question of aerial defence, and more especially for its attacks on the Aircraft Factory. It has been pointed out that in some ways these attacks may do more harm than good, and that, at any rate, The Aeroplane is making enemies for itself unnecessarily.

Unfortunately, one cannot make an omelette without breaking eggs, and one certainly cannot push forward any reform without making enemies. It is also an unfortunate fact that in any new movement of this kind a number of men of active mind, but unfitted for the positions they wish to attain, manage to persuade people at first that they are worthy of serious consideration, whereas in reality they are not. The result is that invariably an enormous amount of money and time is unnecessarily wasted, the really good men are held back, and the whole movement is clogged.

It is in the endeavour to clear the whole aeronautical movement from the encumbrance of these incompetents that The Aeroplane has been from the commencement possibly more harsh in its criticisms and more bitter in its comments than perhaps was kind to the subjects of them.

Those of us who recollect the early days of aeroplanes, only a matter of two or three years ago, can easily call to mind certain quacks and charlatans who then set themselves up as authorities on aviation, and who were accepted by the lay Press very much at their own estimates. Unfortunately, at that time there was practically no technical paper of sufficient independence to explode their reputations, and much harm was done by such people in promoting what were practically bogus meetings, in forming absurd clubs for their own glorification and profit, or in disseminating erroneous ideas about aeroplanes in general, which gave people altogether false notions as to the possibilities, present and future, of aviation. However, practically all these people are now very extinct volcanoes, and in spite of its youth The Aeroplane has had something to do with the extinguishing of some of them.

Unhappily for the progress of aviation other and different troubles beset it to-day. Government apathy has hampered it from the start, and progress which might have been made in spite of Government apathy has been further delayed by the waste of public money owing to the fact that the spending of that money has been in the hands of men who, though doubtless very estimable gentlemen in their proper sphere, are undoubtedly not fitted to perform the particular work allotted to them.

The Dangers of Favouritism.

Favouritism and nepotism are always the besetting sins of Government departments. These sins can never be abolished, but by careful watching and strenuous agitation their effects may be minimised. There do exist men of such high moral ideals that, though a personal friend or relation may happen to be the best man for a job, they will not recommend him for it. This, of course, is the opposite extreme, and may, in its way, be almost as injurious as the lavish handing out of fat jobs to incompetent friends. All that The Aeroplane is concerned with is that the best men should be in the best jobs, and that public money should be spent to the best possible advantage.

Neither of these two desired objects have been uniformly obtained either in the Aircraft Factory or in the appointments in connection with Military Aviation, hence the attacks which have been made—attacks which, it is to be hoped, may soon be discontinued. Let it be said, once and for all, that none of these attacks has been aimed against any particular individual, but simply against a system which has prevented the nation from obtaining the results it has a right to expect.

Erroneous Ideas.

The net result of the present system is that the high authorities at the War Office, and to some extent, perhaps, at the Admiralty, are under the impression that British aeroplanes can only be bought for the Army at the cost of human life. They do not see that the scarcity of British aeroplanes, of British engines, and of British pilots is due to their own policy.

Only recently in the House of Commons Mr. Joynson-Hicks questioned the accuracy of the official ideas on the subject. He was told by Colonel Seely that an endeavour would be made to supply him with a return of the fatal accidents on French and British machines, and Colonel Seely then stated that he did not think the result would be such as Mr. Joynson-Hicks expected, inferring quite clearly that he, at any rate, was convinced of the superior safety of the French machine.

The logical result of this idea would be that if the authorities were convinced that British aeroplane constructors cannot build safe aeroplanes, a certain number of machines would have to be bought in France, but a larger number would ultimately have to be built by the Aircraft Factory, and though Colonel Seely, and even officials of the Factory itself, have stated quite clearly that it is not the intention

of the Government to build machines in quantities at the Factory, it is quite possible that they might, through clever misrepresentation of facts by interested parties, be forced, in spite of themselves, to turn the place into a genuine aircraft factory instead of allowing it to be what the officials protest it is intended to be, merely an aircraft dockyard.

In the Navy, going into dock means going in for repairs; in the Air Service, a machine going into the Aircraft Factory, under the present system, generally means that it is going to be scrapped, and a new one built in the Factory to take its place. The position practically is as if interested persons endeavoured to persuade the authorities that Clyde-built ships were dangerous, and that we had better buy French ships to go on with until all the dockyards had been so enlarged as to be able to supply the nation's needs without outside assistance.

The process is rather a clever one, for things have been so worked as to starve the British manufacturer while the Government establishment has been thoroughly well equipped with the most elaborate machinery, and then the unfortunate manufacturer's lack of equipment is quoted as proof of the fact that he cannot supply what the nation's need demands. It amounts practically to a new variant of our topsy-turvy method of starving the British workman by not protecting his industries, and then buying our goods abroad because British workmen are not able to produce them, and afterwards wondering why we have strikes and industrial upheavals.

However, let us assume that such plans have been finally dismissed from the official programme, and that it is really intended to encourage British constructors. In such case a few suggestions may not be out of place.

As to Engines—

In the first place, if this country is to be self-supporting, so far as the *materiel* of the Royal Flying Corps is concerned, it is obviously necessary that we must set to work to arrange for an adequate supply of British engines.

As has been stated in this paper on more than one occasion, it is even more necessary to begin by encouraging engine builders than aeroplane builders, for there are several firms in existence who can turn out an efficient aeroplane in six weeks or a couple of months, whereas a new engine, or even a new type of an existing engine, can hardly be got through in six months.

Without admitting for a moment that we have not got British engines to-day as good as any made abroad, the fact remains that our makers are not ready to turn them out in quantities because they have no guarantee that they can sell them if they build them. Here then is a possible course of action. It is admitted that the Aircraft Factory has turned out recently two highly efficient biplanes, the capabilities of which are now known to a nicety. Let the Factory build one or two similar machines fitted with removable engine-bearers, and with the fuselages so made as to allow of their being shifted in relation to the planes, so as to alter the centre of gravity of the machine. Let these machines be tested with the Renault and Wolseley engines at present in use, and then let them each be fitted in turn with a Green, a N.E.C., an A.B.C., an E.N.V., or any other British engines of similar weight and declared power. Let these engines be tuned up by the makers' own engineers, so that if anything fails it will be the makers' own fault. Then, if the British engines perform as well as or better than the engines at present in use, let them be bought. The test should be made with petrol and oil for at least four hours' flying, for certain foreign engines owe their supposed superiority to the fact that fuel efficiency is sacrificed to lightness, and these engines, if loaded up with fuel for four hours, actually weigh more than engines of greater power and reliability which are heavier if taken without fuel, or with fuel for a short distance only.

It should be definitely announced that any maker whose engine passes these tests satisfactorily will be given an order for at least six engines, with a guarantee of further orders to follow if his engines keep up to the required standard. There would then be open encouragement to engine builders to spend money on new patterns and alterations in existing designs. At present there is no such encouragement, but merely a half-hearted promise that if the authorities like a certain engine, and the people who make it, they may perhaps buy one or two for experimental purposes. Let the authorities announce definite orders—not prize competitions—for every engine which passes certain definite tests on aeroplanes—not bench tests—and they can in a few months have all the engines they want, and they will get better and cheaper engines than they can get abroad.

—And Aeroplanes.

In the matter of the aeroplanes themselves, the trouble is very much the same. The Francophile section of those connected with aviation will tell one that whenever a good cross-country flight is done, it is done on a foreign machine, and that therefore the foreign machines are better and safer. Certainly there is more cross-country flying done on foreign machines—but why? Simply because there are more of them, thanks to the support the French makers get from their Government. But do not let us forget all the cross-country flying done last year by Messrs. Gilmour, Pizey, England, Fleming, and Jullerot, on Bristols—not to mention Captain Fulton and Lieuts. Barrington-Kennett and Reynolds, also on Bristols; by Lieuts. Samson, Gregory and Longmore, R.N., and Captain Gerrard, R.M.L.I., Mr. Maurice Egerton, and Mr. McClean on Shorts; Mr. Grahame-White and Mr. Compton-Paterson on the G.-W. Baby; Mr. Moorhouse on the R. and M.; Mr. Hucks on the Blackburn; Mr. Pixton on the Avro; Mr. Astley on the Birdling; Mr. Barber on the Valkyrie; and last and most important, Mr. Cody's tour of England on his own machine. If any of those flights had been made in France on French machines the papers—British papers—would have been full of them, and our naval and military attachés abroad would have sent in glowing reports on them. But because they were done at home no notice was taken of them.

Still, they prove that British machines with British pilots can do all that French machines of similar type can do, and more, so there is no reason for assuming that, given encouragement to build, our men cannot produce modern machines to beat the best foreign products.

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PASSENGER FLIGHTS IN MONOPLANE OR BIPLANE.

All-British machines which should produce the machines we want. Let the authorities lay out a certain specific cross-country course from aerodrome to aerodrome, say Brooklands, Hendon, Huntingdon, Oxford, Salisbury Plain, Shoreham, Eastbourne, Dover, Eastchurch, Hendon, Brooklands, and offer an order for six similar machines definitely to the maker of any All-British machine which completes the course in a given time, with premiums of one or more machines added to the order for every hour saved over the minimum. Specify, say, three consecutive days for the complete circuit, and let the pilot please himself what time of the day he flies and let him choose his own three days when satisfied that his machine is right. Also let him start from and finish at whichever point on the circuit he likes best.

The expense to the authorities would be next to nothing. Merely the arrangement for military time-keepers to be at the various aerodromes, and an agreement between the authorities and the aerodrome proprietors to give accommodation to the machines.

In this way we should make it worth everybody's while to spend money and do their best. At present a British aeroplane maker will not buy a British engine because he thinks the fact of its being British may damn his machine with the authorities. Under the suggested tests the expense would be divided all round. It would pay the engine maker to lend an engine to the aeroplane maker. The aeroplane maker would merely risk his machine, and not the cost of the engine as well. The aerodrome proprietors would make profits out of gate-money, for competitors in the tests would be constantly an attraction for visitors. A demand for cross-country pilots would be created, and so a good pilot would get a living wage, instead of being paid rather less than a chauffeur. Public interest would be stimulated. And so, without any huge expense to anyone, without spending money on big prizes, without the big organising expenses of a set competition, the country may get a supply of thoroughly good machines, the engine and aeroplane makers may have business to keep them working and progressing, and aviation generally may be put on a sound footing.

Accident Statistics.

In the House of Commons recently Colonel Seely promised Mr. Joynson-Hicks that he would endeavour to furnish him with a return of the accidents on British and foreign aeroplanes, this being in reply to Mr. Joynson-Hicks' question as to why the authorities considered British aeroplanes unsafe.

It is reported by several well-known pilots that they have been requested to furnish as accurately as possible an estimate of the mileage they have covered during the past year. At the same time inquiries have been made in various quarters respecting fatal accidents on aeroplanes in this country and abroad, so that, taking the two in conjunction, it looks as if an attempt was being made to furnish the desired information, on a basis of miles flown per fatality.

It will be interesting to see how the figures actually work out, though there has certainly been an enormous distance done on British machines of which it is impossible to form even a rough estimate. As a matter of fact, the mere number of fatalities on machines of any particular nationality is no index whatever to the safety or otherwise of the machines unless one knows the exact causes of each accident.

For instance, Mr. Cecil Grace's loss cannot be ascribed to the machine in any way, and Mr. Barber has shown by his splendid flying that the two Valkyrie fatalities were not due to anything more than pilots inexperienced on that particular type of machine trying to do more than they were able. The sole Bristol fatality was also due to the inexperience of the pilot, and though both it and the Valkyrie accidents might not have been fatal if the pilots had not been sitting in front of the machines, this unnecessary additional risk does not appear to weigh with the authorities, who, it is said, have actually bought two of the latest Farman machines in which the pilot is perched further forward still, and is less protected against collisions than in either of the two machines previously mentioned. The fatal accident on the Aircraft Factory's first machine was due probably to a combination of inexperience and bad design, but not to defective material. There remain, then, the death of Mr. Rolls on a French Wright at Bournemouth, when the tail broke in the air, and the Blackburn and Martin-Handasyde accidents.

Now, obviously one cannot estimate the safety of all makes of British machines on the ratio of deaths per mile, when the only two fatalities which can with any show of fairness be ascribed to collapses in the air have occurred to two makes of machines, for it must be remembered that in one case it was the only machine of that make which had ever really flown, and the second the firm had built; while in the other case it was one of the first three successful machines.

Is that method of estimating fair to the other makers, who have turned out anything from half a dozen to nearly a hundred machines without a suspicion of anything ever going wrong with a machine in the air?

Mr. Cody and Mr. Louis Carle testing the 120 H.P. Austro-Daimler engine at 80 miles an hour. In the distance may be seen one of the Aircraft Factory biplanes.

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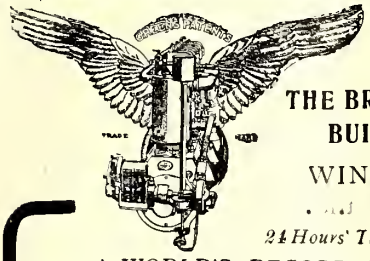

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The Royal Flying Corps.

BY W. E. de B. WHITTAKER.

On March 26th, in reply to a question of Mr. Arthur Lee, the Under Secretary of State for War stated in the House of Commons that "The King has been graciously pleased to approve of the newly constituted aeronautical branch of his Majesty's forces being styled the Royal Flying Corps, and of the wearing by all members of the corps of a distinguishing badge with the Royal Crown superimposed. Similarly, the Army Aircraft Factory, which will now be available for the whole aeronautical service, will in future be designated the Royal Aircraft Factory. His Majesty has granted this privilege in consideration of the specially difficult and arduous nature of the flying service. In reply to the second part of the question, the Army Council have approved of the formation of a standing committee to co-ordinate action in dealing with questions that arise in connection with the corps. The Committee will sit under the chairmanship of Brigadier-General D. Henderson, whose services have been lent temporarily by the Inspector-General of the Home Forces."

And so, by Royal recognition, the flying corps of the country takes its due place in the scheme of things that be, and ranks proudly with the Royal Regiment of Artillery, the Royal Engineers, and other component parts of the British Army.

En parenthèse, comments on two points touched on in Colonel Seely's answer may not be inappropriate. Would it not be suitable to have as a badge a winged hand with the Royal Crown superimposed, similar to that used at one time, I understand, by the Submarine Miners? Secondly, it will be regrettable if Brigadier-General Henderson's appointment as chairman of the new board prevents his being placed in command of the entire corps. Officers of high rank sufficiently experienced in the science and practice of aviation to qualify them for such a command are rare, and neglect to employ a qualified officer in such a manner is to waste good material.

As the years drift by general officers will become as capable of commanding the Flying Corps as they are at present of commanding any other branch of the Army. The beginning of things is the crucial time, and it is therefore well that only those officers of experience should be chosen for an administrative command.

The Question of Command.

It has been the endeavour for some years of those who have the best interests of the Army and Navy at heart so to organise these Services that in times of peace they will be commanded by men who will continue their commands after the outbreak of war. It is of paramount importance that this should be so. In no other way can absolute efficiency be attained, as there is no other method of creating direct responsibility. If a general officer commanding a division knows that he is preparing his command for war service under himself he naturally endeavours to bring it up to the highest level possible, as he knows that he will be personally responsible for any lack of efficiency in his division when the time of trial arrives. Consequently, the indefinity regarding the supreme control of the Royal Flying Corps is causing much anxiety in Service circles.

It was a matter of pride to Colonel Seely when he announced in the House of Commons that his Flying Corps would be a body apart from either the Army or Navy—something between them both and responsible to neither. That his intention at the time of his statement was that the corps should be exempt from the supervision exercised by the General Staff over the entire Army is proved by his reply to a question of Mr. Amery's late in the debate on the Army Estimates. Mr. Amery, on March 12th, said: "Another question is the position of the Air Corps with regard to the General Staff. The work of the Air Corps is intimately connected with the work of the General Staff on its military side. The principal work of the flying men will be scouting, and it

The nucleus of the Royal Flying Corps:—Capt. Fulton, R.F.A.; Lieut. Conner, R.F.A.; Capt. Loraine, Grenadier Guards; and Lieut. Hynes, R.G.A.; taken at the military sheds on Salisbury Plain.

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will be essential in war for aviators to be directly under the control of the Intelligence Section of the General Staff. It is necessary that this Aviation Corps should be under the control of the General Staff, and not any other. It is of the greatest importance that the General Staff should have control of this aviation, and that attention should be drawn to this point from the very first in order to come to a definite conclusion. Our Army should be among the first to adopt any lessons that can be drawn from the developments of modern times. I would like the right honourable gentleman to assure us that the Air Corps, broadly speaking, will be under the General Staff, and that the Training as well as the Intelligence Section of the General Staff will include a large number of officers who have gone through the Air Corps and know what air scouting is."

"One and Indivisible."

Colonel Seely, in his general reply later in the debate, said: " . . . That there should be co-ordination between the Army and the Navy, so that the flying services shall remain one flying service and not be split up into different departments or regiments or any other kind of jealousy, is vital to any air service, as has been generally recognised by those who organise similar services in other parts of the world. He [Mr. Amery] asked me whether Eastchurch would be under the Admiralty. Yes; that would mean that the Navy wing would be under the Admiralty, and the Army wing would be administered by the War Office. He pressed me to say that it should be under a Departmental Staff and gave very strong reasons, if I may say so, that this air service, which must, at any rate as far as we can now see, be a service of reconnaissance and scouting, should have one General Staff. His suggestions will be very carefully considered. I am disposed to think that the arguments he put forward are so sound that his suggestions would have to be adopted."

Though it is apparent, if one accepts the literation of Hansard, which often contains orthographical idiosyncrasies, that Colonel Seely misunderstood the point of Mr. Amery's speech, it is equally apparent that the authorities intended to place the Royal Flying Corps, so far as the military wing is concerned, under the Army Council directly, leaving the Chief of the Imperial General Staff only a modified control over it.

As the C.I.G.S. will, presumably, have the supreme command in time of war, it is clearly of importance that, while the political sky is cloudless, that officer should have an effective supervision of a corps which will form an indispensable part of an army in the field. Colonel Seely says that "both the Army and Navy wing of the Air Corps will be always on a war footing, and the peace and war establishment will be the same." If so, there should be no doubt as to the question of supreme command, and the sooner it is brought under the control of the C.I.G.S in the usual way the better.

An unwillingness to delegate responsibility to individuals is a sign of national decadence, and it is therefore painful to observe the great increase in the number of controlling committees and boards in military government. Noble suggestions may be made and splendid speeches in favour of efficiency may be delivered at meetings of these bodies, but the net result is a careful avoidance of all that is new and untried and a general tendency to take the line of least resistance—the middle road where progress is easy and the end disastrous. Military government is essentially autocratic, and the supreme control exercised at present by a species of second-class debating society is not improving the Army.

Organisation.

Nothing whatever is known beyond the portals of the War Office as to the details of the organisation of the Flying Corps. The unit in the case of the Army appears to be a squadron of twelve aeroplanes. Why twelve? No indication is given as to the types of aeroplanes included in each squadron. On active service the peculiar uses and duties of the aeroplane will tend to break up these squadrons greatly.

Let us assume that the General Officer Commanding has in use all the aeroplanes of the squadron attached to his staff and requires more. Then it will be necessary for him to employ another squadron of twelve, or a section of a squadron—in the first case waste, and in the latter dislocating the squadron arrangements entirely.

Then, again, in a squadron of this size there would presumably be but one wagon containing repair outfits, forges, etc. This might quite conceivably be wanted by three separated sections of the squadron at one time.

It is possibly intended to divide each squadron into two or three sections of six or four aeroplanes apiece. Much the same objections apply even if this is so, as the dislocation would be just as harmful if a section were removed for any length of time. The squadron is cumbersome, and if the sections are to be employed separately, why not make them separate self-contained organisations in the beginning?

Would it not be better to limit the squadron (call it by what name you will) to six aeroplanes, two of which would be weight-carriers with seating capacity for more than two? It might be a captain's command with three subaltern-pilots and six pilots drawn from N.C.O.'s and men. Eighteen soldier-mechanics would probably be sufficient.

Transport.

The transport arrangements would be as follows: four motor wagons for the four lighter aeroplanes, which would fold, as does the artillery-type Blériot, and two motor wagons with trailers for the heavy multi-seaters. These latter two could carry spares and the men's kit on the motor wagon. There would be, also, a motor repair wagon containing a forge and a complete outfit of tools. For the officers there would be a five-seated motor car of, say, 40 h.p. In all, seven motor wagons, two trailers, and a motor car, occupying altogether about 140 yards of road.

On the figures supplied by Colonel Seely, this arrangement would allow for the formation of fourteen squadrons. Of this fourteen, two or three squadrons should consist entirely of light single or double seaters. It appears to be the policy of the War Office to ignore the single-seater on the score of its being possible to design and build two-seaters of similar size and weight. Admitting this, it seems to have been forgotten that the single-seater would have a wider range of action, owing to its greater speed and its greater capacity for fuel. Strategical reconnaissance over a wide range is undoubtedly the duty of the single-seater. But if the powers that be have opposite views, there is no more to be said. The two or three squadrons of small machines I have advocated would be for the use of the General Staff for extended reconnaissance.

The Expeditionary Force.

The expeditionary force—that is to say, the army which we would be able to employ in the field—would consist, roughly, of six divisions of infantry, two mounted brigades, and one division of cavalry. The General Staff would absorb at least four squadrons of aeroplanes for reconnaissance, etc. To some extent the number of aeroplanes employed by the Staff would vary according to the number employed similarly by the enemy. Each infantry division ought to have at least one squadron for the direction of artillery fire, etc. One presumes that, under present conditions, cavalry would prefer not to use aeroplanes. Out of the fourteen available squadrons (of *six* machines each), only four would be left after disposition on the lines mentioned above, and that is assuming that only one squadron is required for each infantry division.

Four squadrons of aeroplanes for the rest of Great Britain! It will be found that a large increase of both men and machines is necessary. So long as the War Office continue to regard their scheme as tentative, all is well, but there is a tendency for such experiments to become permanencies.

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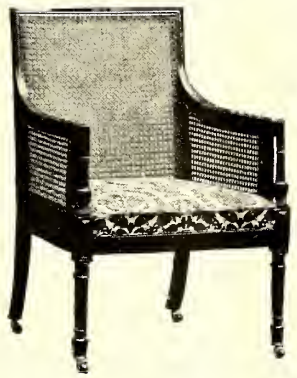

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Personnel.

The next question of importance is that of "personnel." As has been frequently pointed out, officers commanding regiments have an intense dislike for recommending their most efficient officers for duties which will take them away from their regiments, and the Royal Flying Corps will have but little use for the *inefficient* regimental officers.

Colonel Seely, in his statement on the Army Estimates made before the House of Commons on March 4th, said: "If an officer wants to join the Flying Corps, he has first to get the consent and approval of the military authorities." That is to say, he applies through his O.C., who may decide not to forward his application to the central authorities. It ought to be laid down that all applications *must* be forwarded at once, through the usual channels, to the War Office.

As each regimental officer is reported on confidentially from time to time by his O.C., the War Office have at hand quite sufficient information to permit of suitable selection. It has been suggested by a civilian with views on military aviation that junior officers should apply direct to headquarters. He forgets that soldiers have, as a rule, curious views in favour of the maintenance of discipline.

There will be no lack of applicants as soon as the correct procedure is settled. It should be possible for cadets at Woolwich and Sandhurst to select the Royal Flying Corps in the same manner that they at present signify their desire to be appointed to specific regiments. If their qualifications are suitable and their applications are approved, they could be gazetted to the Royal Flying Corps, after two years' service in a line regiment, which would give them the necessary training.

But everything connected with military aviation is in such a nebulous state that nothing can be said with definity. I can say nothing with regard to the employment of civilian aviators. It is possibly necessary, but under conditions somewhat different from those hazily sketched by Colonel Seely in his original statement. One can say no more, as it is probable that no definite plan in detail has yet been drafted at the War Office. Haste has never been encouraged in Whitehall.

French Military Aviation.

The Minister of War has issued to G. O. C. Army Corps two circulars on the reorganisation of the "fifth arm." Both deal with the question of personnel, the first as regards officers and the second as regards men. In the first circular it is ordained that G. O. C. Army Corps shall forward applications from all officers desiring to be attached permanently to the aerial corps. These officers must state whether they wish to become pilots of aeroplanes or dirigible balloons, or both. Their applications must contain (1) Particulars of their physical condition, weight, and length of sight, and of (2) their sporting capabilities and knowledge of petrol motors.

The second part of the circular deals with those officers who wish to be temporarily attached to the air corps without great interruption of their normal service. All these officers, whether in training as pilots, or observers on aeroplanes or dirigibles, will be considered whilst in the air as actually part of the aeronautic establishment, and will rank as such for pay, allowances, and compensation.

The greater number of officers training in this semi-detached manner will be officers of the General Staff wishing to acquire a useful knowledge of the conditions under which military aviators work.

The second circular ordains that applications from private soldiers of all arms in the French service for attachment to the Air Corps are to be forwarded to the Ministry of War through the Inspector-General of Aeronautics.

The general conditions are that the applicants ought to have from April 1, 1912, two years yet to be served, or to be willing to re-engage for such a period. The 1910 conscripts are exempt from this rule, as are also candidates who wish to become pilot-aviators, or who have a sufficiently good sporting record and are considered specially suitable. Their applications must contain (1) Full details as to their service and a signification of their willingness to re-engage if necessary as above; (2) Trade in civil life; (3) Detailed account of previous aeronautical training if any; (4) Physical condition (health, weight, and sight); (5) Sporting record; (6) Desire to learn wireless telegraphy; (7) Conduct record; (8) Confidential report of O.C.

The order of selection will be as follows:—(1) Pilot-aviators; (2) Soldiers having received partial instruction in aeronautics; (3) Soldiers who in civil life are mechanics with a knowledge of petrol engines for aeroplanes; (4) Soldiers who in civil life are mechanics with a knowledge of petrol-driven car engines; (5) Soldiers possessing special physical or sporting recommendations.

During their preliminary training they rank on the establishment of the air corps and receive pay and allowances accordingly.—W. E. de B. W.

French Naval Aviation.

Some points of the organisation of the new naval air corps have been officially announced by the Ministry of Marine. The entire corps will be under the command of a naval officer of high rank, who will bear the title of Commandant (in chief) of Naval Aviation.

The corps will be divided into three sections: (1) An aviation centre on the sea coast; (2) a mother ship as a floating headquarters for aviation, and under the personal control of the *Commandant Supérieur de l'Aviation Maritime;* (3) a flotilla of ships.

The land centre will be under the command of an officer aviator. Officers of the rank of "*enseignes de vaisseau de 1re. classe*" and "*lieutenants de vaisseau*" will undergo a training of nine months. The number will be regulated by the Ministry of Marine, and the selected officers will have to pass a severe medical test.—W. E. de B. W.

Mr. Gustav Hamel, who on Tuesday last flew across the Channel with Miss Trehawke Davies.

The First Woman to Cross the Channel.

On Tuesday morning last Mr. Gustav Hamel distinguished himself by taking the first feminine passenger across the English Channel by aeroplane. Leaving the Hendon Aerodrome at 9.38 a.m. on his Blériot two-seater with Miss Trehawke Davies as passenger, he flew round the North of London, helped by a strong North-Westerly wind, and was observed at several points, his height being estimated at about 2,000 feet. They passed over Dover about 11 a.m., and were then seen to be at about 6,000 ft. The time taken to reach that point, which is 80 odd miles from the start, shows that the wind cannot have been the help it seemed likely to be at the start. The Channel was safely crossed, but the Gnôme failed them on the other side, and they came down at Ambleteuse, south

of Cap Grisnez. After a slight delay they went on to Hardelot, the point whence Mr. Hamel started on his first Channel flight, and alighted for lunch at 1.45 p.m. Miss Davies has already done a great deal of cross-country flying as passenger with Mr. Barber on his Valkyrie, and with Mr. Hamel, and it has long been her ambition to be the first woman to cross the Channel by aeroplane. Congratulations to her on achieving her ambition.

The Monaco Hydro-Aeroplane Meeting.

This meeting, which began on March 24th, ended on Sunday. The proceedings were divided into six trials or tests, four of which could be contested day by day and count accordingly in the final scoring, leaving two which can only be taken once in the course of the meeting. They are as follows :—

A.—Arise from calm water and fly out round some buoys placed in the open sea. Counts one point.

B.—Alight in calm water after circling the buoys. Counts one point.

C.—Arise from rough water. Counts two points.

D.—Alight on rough water. Counts three points.

The two following tests could be attempted as often as might be desired during the meeting, but only counted once :—

E.—The aeroplane must be driven ashore after alighting on the water, so that the pilot may land with dry feet. Counts four points.

F.—The aeroplane must be driven on to the sea surface from the shore, after which it must rise. Counts four points.

Four extra points accrued to those machines which fulfilled these tests.

The prizes were as follows :—8,000 francs to the winner, 4,000 francs as a second prize, 3,000 francs as a third prize. A sum of 2,000 francs was granted to each machine left unclassed at the end of the meeting. The entrants were Colliex and Rugère (Voisin biplanes), Renaux (Maurice Farman biplane), Robinson and Paulhan (Curtiss biplanes), Fischer (Henry Farman biplane), Benoist (Sanchez Besa biplane), Taddeoli (Mouette Perrot), Caudron (Caudron-Fabre biplane), and Baillod (Baillod).

Below I give the results day by day :—

March 24th.—(1) Fischer contested with two passengers, tests A, B, C, D, scoring 9 1-10 points. (2 and 3) Robinson and Paulhan both scored 7 points for tests A, B, D with one passenger each. (4) Renaux scored 5 2-10 points in tests A, B, C with two passengers. (5) Caudron, one passenger, 4 points in tests A, B, C. (6) Colliex, with three passengers, 3 5-10 points in test A. This latter pilot, while alighting on the water after a test, was completely upset by a wave and his machine wrecked. His three passengers were practically unhurt.

March 25th.—(1) Fischer, 35 points; (2) Paulhan, 31 points; (3) Robinson, 26 points; (4) Caudron, — points; (5) Renaux, 5 points; (6) Colliex, 1 point; Rugère and Benoist, 0.

March 26th.—(1) Fischer, 45 points; (2) Paulhan, 40 points; (3) Robinson, 33 points; (4) Renaux, 33 points; (5) Caudron, 30 points; (6) Colliex, 29 points; (7) Benoist, 2 points.

March 27th.—(1) Fischer, 57 points; (2) Paulhan, 49 points; (3) Renaux, 46 points; (4) Robinson, 43 points; (5) Colliex-Rugère, 41 points; (6) Caudron, 37 points; (7) Benoist, 12 points; (8) Colliex, 1 point.

March 28th.—(1) Fischer, 75 points; (2) Renaux, 59 points; (3) Paulhan, 59 points; (4) Robinson, 50 points; (5) Colliex, 41 points; (6) Caudron, 37 points; (7) Benoist, 15 points.

March 29th.—(1) Fischer, 87 points; (2) Renaux, 74 points; (3) Paulhan, 68 points; (4) Robinson, 57 points; (5) Caudron, 51 points; (6) Benoist, 41 points.

March 30th.—(1) Fischer, 99 points; (2) Renaux, 88 points; (3) Paulhan, 77 points; (4) Robinson, 64 points; (5) Caudron, 58 points; (6) Benoist, 50 points.

The Royal Aero Club.

As the result of the ballot, the following is the Executive Committee of the Royal Aero Club for the ensuing year :—Sir Charles D. Rose, Bart., M.P. (Chairman); Griffith Brewer; Col. J. E. Capper, C.B., R.E.; G. B. Cockburn; Capt. Bertram Dickson, R.F.A.; John Dunville; Capt. J. D. B. Fulton, R.F.A.; Col. H. C. L. Holden, C.B., R.A., F.R.S.; Prof. A. K. Huntington; F. K. McClean; J. T. C. Moore-Brabazon; Alec Ogilvie; Mervyn O'Gorman; C. F. Pollock; Commander C. R. Simson, R.N.; A. Mortimer Singer; The Marquess of Tullibardine, M.V.O., D.S.O., M.P.; Roger W. Wallace, K.C.

A meeting of the Committee was held on Tuesday, the 26th inst., with Sir Charles D. Rose, Bart., M.P., in the chair.

Mr. Roger W. Wallace, K.C., in proposing Sir Charles Rose, Bart., M.P., as Chairman of the Club, said he was sure that his proposal would meet with the unanimous approval of all members of the Committee, and that the traditions of the Club would be in excellent hands. He and all the members of the Committee would give him their cordial support. Mr. Griffith Brewer seconded the motion, which was unanimously carried.

Sir Charles Rose, in accepting the invitation, paid a high tribute to the devoted labours of the retiring Chairman, and expressed the hope that the Club would long enjoy the benefit of Mr. Wallace's counsels and assistance.

Prof. Huntington stated that it was the intention of the Committee to elect Mr. Roger W. Wallace a Vice-President of the Club, and to ask him to continue to represent the Club in its foreign relations. The resolution was seconded by Mr. C. F. Pollock, and carried unanimously.

The following new members were elected :—Capt. E. F. B. Charlton, R.N., A.D.C., and Staff-Surgeon Hardy Vesey Wells, R.N.

The following Aviators' Certificates were granted :—(199) William Ewart Hart (Bristol Biplane, Penrith, New South Wales); (200) Capt. Francis John Brodigan (Bristol biplane, Salisbury).

The Aeronautical Society

The Annual General Meeting of the Aeronautical Society was held on March 27th at the Royal United Services Institution, Mr. A. E. Berriman taking the chair. Various alterations were made in the rules, but several of the amendments and alterations on the agenda paper were not put forward for lack of anyone to propose them, their originators not being present.

The election of the new members to the Council was declared as follows :—For the technical side—Capt. A. D. Carden, R.E., Mr. T. W. K. Clarke, Mr. J. W. Dunne and Mr. J. H. Ledeboer. On the non-technical side—Col. J. E. Capper, R.E., Lieut. R. Gregory, R.N., Mr. Frank McClean and Major-General R. M. Ruck.

After the ordinary business of the meeting had been transacted, Mr. Handley Page read a most interesting paper on Eiffel's studies in plane curvatures, illustrated by a number of lantern slides showing the Eiffel pressure curves, as well as the results of plotting a number of those curves himself. It must be confessed that so far as some of the audience, and certainly the present writer, were concerned, the effect of Mr. Handley Page's lecture was much the effect the arguments of higher theological critics must have on the normally serious-minded youth brought up on the Church Catechism, for Mr. Page demonstrated that even the great Eiffel made the most elementary mistakes, which, so far as the non-scientific mind of the writer is concerned, appeared to deprive his much-respected curves of most of their practical value.

Official Notices.

Mr. E. P. Frost, D.L., J.P., has accepted the invitation of the Council to become a Vice-President of the Society.

The fifth meeting of the present Session will be held at the Royal Society of Arts, John Street, Adelphi, on Monday, April 15th, at 8.30 p.m., when Mr. T. W. K. Clarke will read a paper on "Aeroplane Stability, with a description of a new gyroscopic apparatus" (which will be shown in action).

The sixth meeting of the present Session will be held at the Royal United Services Institution, Whitehall, on Monday, April 29th, at 8.30 p.m., when Capt. C. H. Ley will read a paper on "The Practical Use of Meteorology in Aviation."

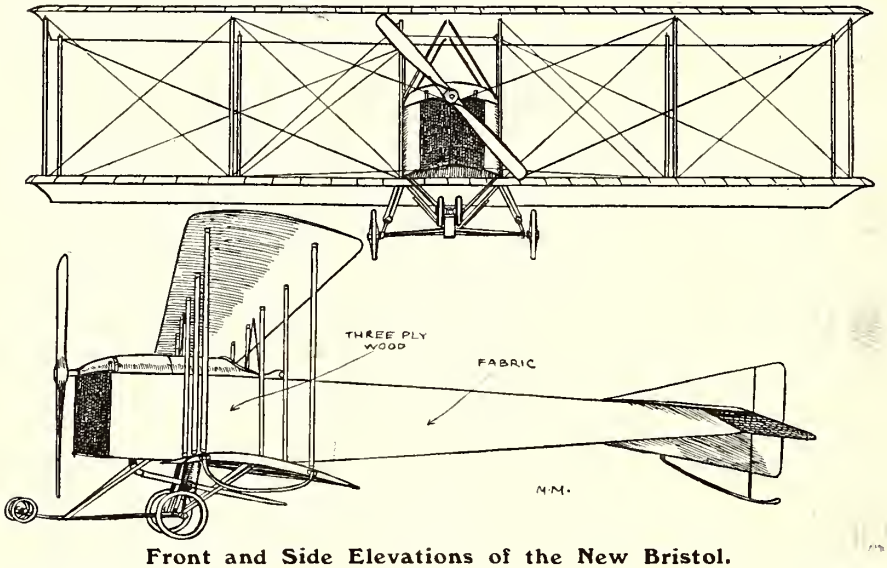
The next informal meeting at 11, Adam Street, Adelphi, will be held on Monday, April 22nd, at 5 p.m., when the subject for discussion will be the "Atmospherical Conditions at Hendon Aerodrome."

The Committee of Enquiry, which was appointed to report and advise on the Society's position, has now handed over to the Society a balance of £12 13s. 6d. When entering upon its duties it appealed for subscriptions from the members, in order that its work might be carried out without expense to the Society as a whole. As a result of this appeal the sum of £27 16s. 6d. was received. The expenses incurred were £15 3s.—T. O'B. Hubbard (Secretary).

Easter Flying at Brooklands.

It is announced that among the motor-racing attractions at Brooklands on Easter Monday an aeroplane race finds a place. The event is said to be a cross-country handicap over a course to a mark five miles from the aerodrome and back, but as The Aeroplane has not been favoured with particulars of the competitions it is impossible to give more details.

The Latest Bristol Biplane.



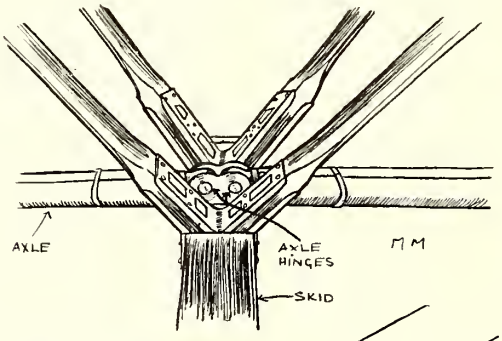
Front and Side Elevations of the New Bristol.

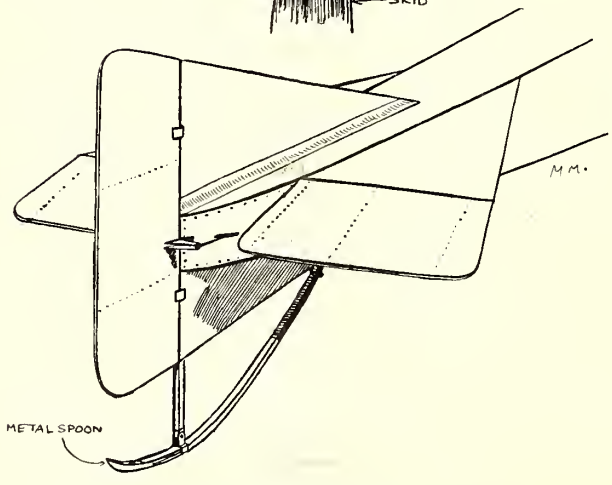
One of the handsomest and at the same time most beautifully constructed machines yet produced in this country is the new Bristol biplane designed by Mr. E. C. Gordon England. This machine is built obviously for military purposes, and as such it should be altogether excellent. Mr. Millar's sketches show clearly the salient points of the machine.

It will be seen that head resistance has been reduced to a minimum for biplanes of the type using a double row of struts. The lines of the machine throughout are particularly clean, and the control planes, although exceedingly small, are undoubtedly efficient owing to the enormous leverage of the long fuselage. The outer sections of the planes are made to detach for easy packing, and a sketch is given of the quick release catch for the wiring. The method of attaching the struts to the wing spars is also shown in detail.

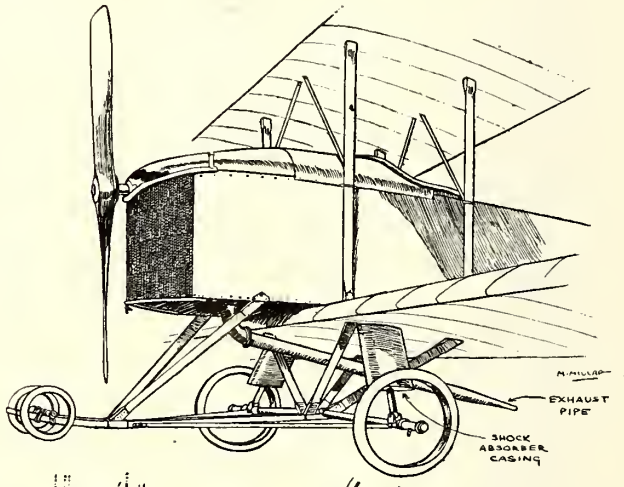
From a military point of view the machine should be very effective, because the fuselage is placed high above the lower plane, so that the passenger and pilot, who sit side by side, have an excellent view down over the front of the lower plane; in fact, their view is quite as good as that of the passenger on the ordinary box-kite type of biplane.

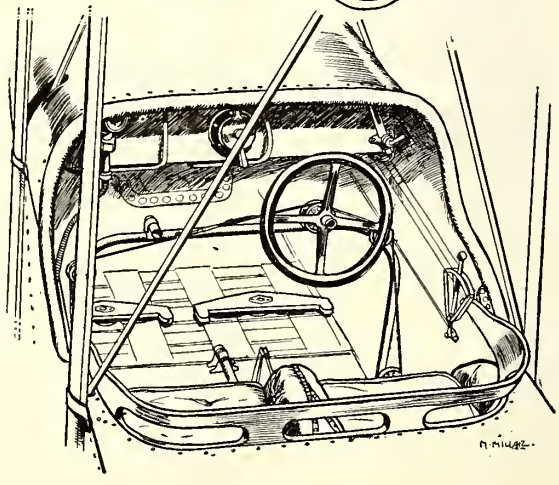
The seating arrangements are very good, for both pilot and passenger are thoroughly protected against the weather, and yet have a good clear view. As may be seen in the sketch, the machine is fitted with double controls, but at present only a single wheel has been fitted. The various instruments, switches, and so forth are neatly disposed where they can be





Spring axle attachment and Tail arrangement.

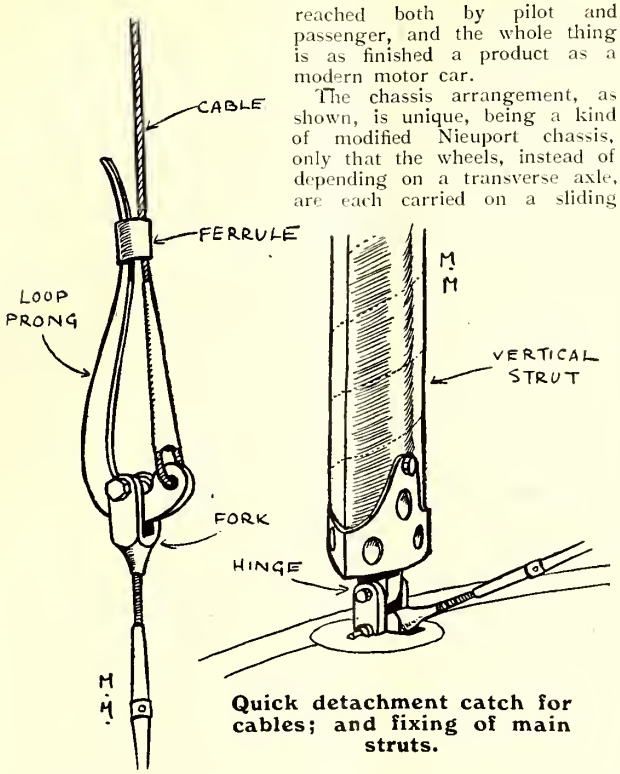




Chassis details and Seating accommodation.

reached both by pilot and passenger, and the whole thing is as finished a product as a modern motor car.

The chassis arrangement, as shown, is unique, being a kind of modified Nieuport chassis, only that the wheels, instead of depending on a transverse axle, are each carried on a sliding



Quick detachment catch for cables; and fixing of main struts.

tube which runs inside a casing. In this casing are stout rubber bands acting in tension as the weight of the machine comes on to the wheels, and in compression when the wheels spring back, thus taking up the rebound as the machine bumps along the surface of rough ground.

The warping arrangements are exceedingly neat, absolutely simple, and immensely strong. A single huge cable runs from

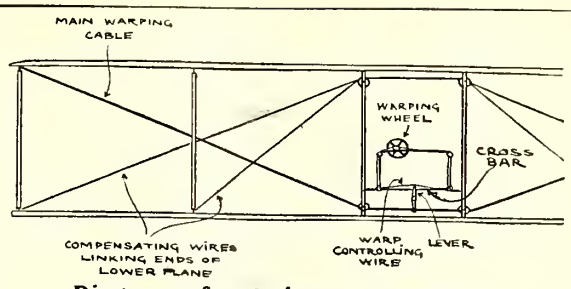


Diagram of warping arrangements.

the main warping lever to each end of the top plane, and does all the actual warping. The tips of the lower planes are linked by connecting cable, which assists the main cable in its action, but this linking cable is not connected in any way with the warping gear.

The engine at present in the machine is a 50-h.p. Clergêt, with the propeller geared down two to one by means of a chain, and small as the engine is it flies the machine quite nicely, showing the efficiency of Mr. England's design. It is, however, intended to fit a larger engine, and, in fact, the machine was designed for much greater power. Undoubtedly with a bigger engine the machine would compete successfully with anything else of its type in existence, and certainly for neatness of design and excellence of workmanship few machines equal it and none surpass it.

One hopes that this newest type of Bristol biplane will be even more successful in its own day than were the stoutly-built Bristol biplanes of the box-kite type during the past year or so.

If one might make a suggestion, it is that a number of lighter and cheaper biplanes of the same type should be produced as soon as possible for the use of pupils at the Bristol schools, for a man trained on a biplane of this type will take to the control of a monoplane very much more quickly than if his experience has been only of the box-kite type, and, further, even such slight accidents as those which befel Major Benwell and Lieuts. Longcroft and Carfrae and others on the older type machine will be absolutely avoided in this type.

Congratulations to the constructors and the designer of the machine on what is certainly one of the most creditable products of the year.

The Government Orders.

The War Office contracts for British manufacturers, which have been hanging fire pending the final approval of the designs of the machines by the authorities, are now being definitely placed. L. Howard Flanders, Ltd., have received a well-deserved order for four monoplanes, and A. V. Roe and Co. for three biplanes; unfortunately, all with foreign engines. It is understood that orders are also being placed with Messrs. Martin and Handasyde, Short Bros., and Mr. S. F. Cody, but at the moment of writing no definite confirmation of these orders is to hand. These, however, will only account for a few of the twenty or so British machines which are to be ordered as soon as possible, and one gathers that other orders are being temporarily suspended pending the consent of the makers, with whom negotiations are in progress, to make certain minor alterations in the designs or structure of their machines.

The writer is able to state fairly definitely that orders for machines are practically waiting for British firms who can convince the authorities that their machines are properly constructed, properly designed, and able to fly as well as those of the firms with whom orders have already been placed.

A Regrettable Demise.

It is with great regret that The Aeroplane learns that the Aeronautical Syndicate, Ltd., which has ranked high among the pioneer constructors in Great Britain, is going out of business, owing to the opinion of the directors that the future is too problematical to encourage them to go to the expense of equipping the kind of factory necessary to enable their firm to hold its position.

The Aeronautical Syndicate, Ltd., was formed early in 1909, and the principal shareholders are Messrs. Battersby, Ferguson, Schmettau, and Ridley Prentice. Nearly thirty machines have been constructed. All of them have flown, and one of them was the first British monoplane to carry passengers, a record which was held for nearly a year. A great many long-distance cross-country passenger flights have been accomplished. A flying school and also a school of aeronautical engineering have been maintained. The work of the company has been distinguished for the soundness and excellence of constructional details, and the staff of mechanics has been among the best in the country.

It is certainly a great pity that the firm should have decided to close down, especially as Government orders are now coming through, and the Viking type of machine is such as would be likely to find favour among military aviators. It seems probable that the omission of the authorities to ask for tenders from the Aeronautical Syndicate, Ltd., for some of the first batch of machines to be ordered may have influenced the decision of the directors of the firm; but it is only reasonable to suppose that their turn would have come very soon, especially as only a few machines have so far been ordered. Possibly it is not even now too late to reconsider this decision, for we are not yet overrun with firms who are able to turn out first-class work, and the A.S.L. workmanship was such as to command consideration when Government orders are being placed.

Mr. Clift's Developments.

As everyone connected with aviation knows, the Clift Aviation Maps are recognised as occupying the leading position, and it is interesting to know that Mr. Clift has now arranged that these maps are to be published by the Geographia Designing and Publishing Co., Ltd. The new maps will embody the best features of the Clift map and of the Gross map, and various recent improvements are being added. In future the maps will be known as the Clift-Gross maps, and they can be obtained either of Mr. Clift or of the Geographia Co.

Route maps are now being made to cover the whole country from any one aerodrome to any other aerodrome. The standard width is increased to 12 in., which, on a scale of two miles to the inch, gives twenty-four miles width of country. Roller cases can also be supplied to allow of the maps being cut down to 6½ in. wide, 9 in. wide, or 12 in. wide. In view of the large amount of cross-country flying which is about to take place this year, they should be in big demand.

Wing Strains.

By P. K. TURNER.

I have been asked by a well-known designer-constructor to give some details as to the comparative strength of similar wings, fitted in one case with king-posts, and in the other with ordinary tie-wires. In the following article I propose to suggest how one may arrive at the strains on the spars and wires, in such a way that anyone knowing elementary algebra

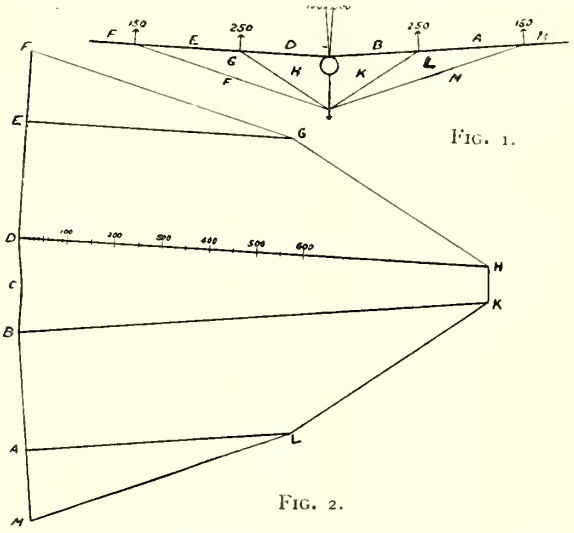


Fig. 1.

Fig. 2.

and geometry can apply the methods of "Theory of Structures" to wing design.

Later on I hope to show how to find the positions of the wire attachments, and the amount of lift at each point. For the present I am going to assume that the wings are as shown in Fig. 1: 32 ft. span, dihedral 1 in 16, total lift 1,000 lbs., apart from the weight of the wings themselves, and

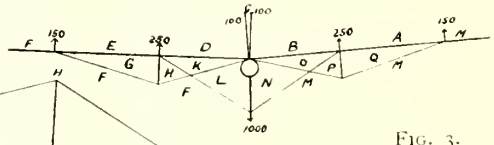


Fig. 3.

Fig. 4.

tapered and "washed out" so that the lifts are as shown at the points of attachment.

First, it is necessary to make a large and very accurate scale diagram (in front elevation) of the wings and their under stays, as shown in Fig. 1, inserting the loads as shown. Then the diagram must be lettered, the system being as follows: Every space enclosed by wires or spans must contain a letter, and every external space which comes between two loads: e.g., there are letters above the spar between the

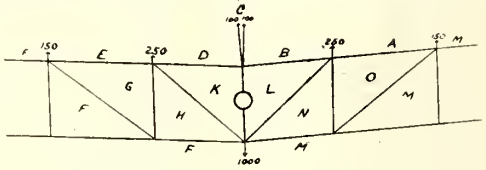


Fig. 5.

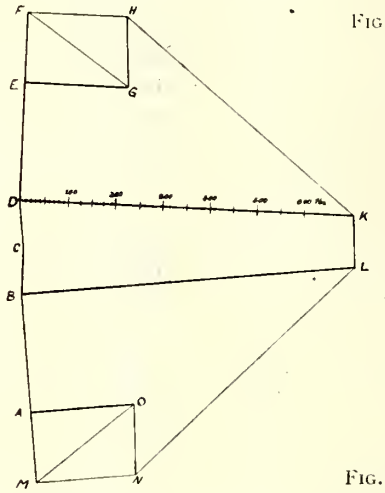


Fig. 6.

points of attachment (A, B, D, E); a letter between the two loads at the root of the wing (C); and letters on each side between the central downward load (which is the weight of the machine), and the outside point of attachment (F, M). This diagram having been drawn across the top of the paper, the stress diagram proper may be commenced.

This is, to all intents and purposes, nothing more than a glorified triangle of forces. The points in the scale diagram where struts and wires meet are taken one by one, and "polygons of forces" described for them, and the forces on the spars and wires scaled off these polygons.

We will commence near the bottom *left*-hand corner of the paper (see Fig. 2) by drawing a line parallel to the load of the *right* wing in the drawing. Now, to a scale of pounds, set off a distance M A equal to the load M A (150 lbs.) on the scale sketch, and a further distance A B equal to the load A B (250 lbs.) on the sketch; then B C, parallel to the load of the *left* wing, and equal to the load B C. This method is continued as far as E F, which finishes the known strains. We have now to find the strains on the spars and wires.

Commence with the outside point of the right wing—there are here three forces—the lift M A, the spar stress A L, and the tie-wire stress L M. To find these, all that is necessary is to draw a line from M parallel to the tie-wire, and a line from A parallel to the spar; these two lines intersect at L, and the lengths A L and L M represent to scale the forces A L and L M on the spar and wire respectively.

It will be noticed on comparing the diagrams that (1) a space in the scale sketch is represented by a point on the stress diagram; (2) the force on a strut or wire between two letters in the sketch is represented by the length of the line joining the corresponding letters on the stress diagram; (3) the line joining two letters on the stress diagram must always be drawn parallel to the corresponding strut or wire on the scale sketch.

We now proceed to deal with the forces about the next point on the wing. Here we have the thrust of the outer spar section L A, already drawn; the lift A B, already drawn; the thrust B K; and the pull on the wire K L. We draw lines from B and L parallel to the spar and tie-wire, which intersect at K, giving the thrust on B K and the pull on K L.

Next we take the spar junction. Here we have the thrust K B, lift B C, lift C D, already drawn, and the thrusts D H and H K to be found, and, working on the same lines as before, we find the point H. Similar proceedings give the point G, and it will be found that, if the sketch and diagram have been accurately drawn, a line drawn from G parallel to the tie-wire G F passes through the point F, thus "closing" the diagram.

In the particular case under discussion it will be found that the lengths scaled off the stress diagram are as marked on the scale sketch. It must be noted that the load on the *pylone* is equal to that marked, *plus* the weight of the body and its contents; for the weight is situated at the top of the *cabane*, and is sustained from the bottom.

Passing next to the wing with king-posts, Fig. 3 shows a similarly loaded pair of wings, with the wings stayed from a *pylone*, or chassis, of the same depth below the wing-roots, and with the king-posts of such a length that the outer wing tie-wires are at the same angle. Fig. 4 shows the stress diagram. The various lifts are marked off just as before, and the first "polygon" M A Q is exactly similar to the polygon M A L on Fig. 4. On attempting, however, to deal with the point at which the king-posts are fixed, we find a difficulty in that there are three lines, B O, O P, and P Q, whose lengths are unknown—or, to put it differently, we do not know the positions of either of the points O or P.

This prevents progress, for it must be noted that a polygon can only be described when there are not more than two lines unknown, or, alternatively, more than one point unknown. We deal, therefore, next with the tip of the king-post, obtaining the polygon M Q P. This gives us the position of the point P, so we can now deal with the "root" of the king-post, getting the polygon P Q A B O.

On examining the forces about the roots of the wings, we find that K, L, and N are all unknown, so that this point cannot be dealt with. We therefore describe the polygon for the *pylone*. Here we find that the force M N is apparently unknown. A little consideration, however, shows that, as the force M N is, under another name, the force acting on the main tie-wire, which is already represented by the line O P, the line M N can be drawn, the condition being that it is equal and parallel to O P. We thus have, for the *pylone*, the polygon M N L F.

We can now deal with the wing-roots, obtaining the polygon L N O B C D K and finding the position of K, the line N O being drawn equal and parallel to M P. Knowing the length and direction of L K, we draw F H equal and parallel to it, and complete the polygon F H G, representing the tip of the left king-post. By drawing H K equal and parallel to F L we can complete the polygon G H K D E for the king-post root, and we then "close" the diagram by the final polygon G E F, giving the forces on the left wing-tip.

For a Biplane.

In Fig. 5 is shown a pair of biplane wings to lift the same load. I have taken them at their greatest disadvantage, allowing no central cellule, and keeping the same span as the monoplane. I have taken the gap as 5 ft.

In making the stress diagram for a biplane (Fig. 6) there are one or two new considerations involved. Firstly, the outer section of lower plane and the outer strut have no load (no load, that is, except the direct bending load on it—*i.e.*, no load due to the rest of the bracing). Secondly, since the load is derived half from each plane, and is transmitted up the struts to the top plane, each strut, except the body-strut, will have half its corresponding load added to the stress caused by the bracing—*e.g.*, the strut N O has a bracing stress of 150 lbs., and half the direct load on it is 125 lbs. (*i.e.*, half of A B), so that the strut has actually a total load of 375 lbs. Thirdly, the bracing stress on the lower spars is normally *tensile*, and not compressive. If the tie-wires not shown in the drawing—those that hold up the wings when at rest—are tightened, so that all the tie-wires are absolutely taut, a compressive stress may be set up; but it is impossible to calculate it, so that the safest course to adopt is to refrain from excessive tightening of the wires. Lastly, the strain on the body-strut is as measured (110 lbs. in this case) *above* the body; but the parts of the struts which are *below* the body are subjected to the weight of the body as well as the stress of the bracing.

In the accompanying table are shown the loads on the various corresponding parts of the three pairs of wings, which are placed in order of merit:—

Type.	Spars.		Total on Tie-wires.		Struts.	
	Outer.	Inner.	Outer or King-post.	Inner or Main.	Middle or King-post	Body or Pylone.
Biplane	220	710	260	640	375	1,110
Stayed Monoplane ...	560	993	590	500	—	1 075
King-post ,, ...	560	1,600	590	1,190	330	1,300

I have now dealt with the stresses on wing-bracing. In doing so I presumed that the loads on the points were known. The finding of these is the next subject for attention.

The Gilmour Memorial Fund.

Once more there is a very satisfactory addition to the Gilmour Memorial Fund to report, and besides handsome subscriptions from the late Mr. Gilmour's personal friends, a large number of his humbler admirers have subscribed their mites to help in perpetuating the memory of one of our pioneers. Mrs. Handasyde, who has been working indefatigably for the fund, is responsible for £10 17s. 9d. of this week's addition, and the present state of the list is as follows:—

	£	s.	d.
Amount already acknowledged	98	14	0
C. W. May	5	5	0
Captain H. F. Wood	5	0	0
Captain Raleigh; J. Lawrence Santoni; J. Kennedy; Lieut. J. C. Porte, R.N.; G. Henry Pointer—£1 1s. each (5)	5	5	0
Mrs. Beatrice Malcolm	1	0	0
T. O'B. Hubbard	0	10	6
Herbert W. Lambert; Gordon Bell; H. P. Martin; G. H. Handasyde; L. Curtis Rawlins; Sheila O'Neill—10s. each (6)	3	0	0
G. McL.	0	5	0
Fred Castleman; C. W. Arden; H. S. Starkey; A Visitor; C. J. S.; C. Locke; W. Lawrence—2s. 6d. each (7)	0	17	6
Sydney Axford; T. B. G.; G. M. Chapman; M. Jones—2s. each (4)	0	8	0
E. H. Eric Smith; F. L. Boyne; A. J. Lucas; V. O.; P. C.; R. Graham; E. J. A.; E. Percy Gurnett; W. S. Stott; H. F. Luxford; F. R. Luxford; R. H. C. Frakes; E. T. Nethercoat; A. Nethercoat; A. Jackson; R. Meakins; T. Thomas; H. J. Merriman; M. K. Weyobling; N. C.; C. J. Lewis—1s. each (21) ...	1	1	0
A. R. B.; J. W. H.; F. W.; Bobby; Harris; A. Adams; J. B. Squire; J. W. Bowler—6d. each (8)	0	4	0
Joe; Eric; N. Bryan—3d. each (3)	0	0	9
Total	£121	10	9

The Importance of Wire.

One of the most important points about an aeroplane, in which every detail is of vital importance, is the quality of wire used in its construction, and the greatest care should be taken to use only the most reliable material.

A firm that has made a name for the quality of its goods is Frederick Smith and Co., Ltd., of Halifax, who make a speciality of tensior wire for aeroplanes. This firm supplies wire in accordance with the ideas of various aeronautical engineers, and is always glad to give information and advice, acquired by long years of experience, respecting the best type of wire for various purposes. It is worth while to mention that the firm are contractors to the British and Indian Governments, besides various Colonial and foreign governments, and railway companies. They are also telegraph wire manufacturers, submarine cable manufacturers; they make steel colliery ropes, galvanised wire for hawsers, hardened and tempered steel wire of all kinds, and plain and tinned weaving wire, and the firm was established in 1859.

Another Record.

On March 28th M. Frantz, on a Savary biplane, 70-h.p. Labor motor, accompanied by MM. Ferio and Frangeois, flew to a height of 2,125 metres, thus beating the world's height record with two passengers previously held by M. Prevost on a Deperdussin monoplane, 100-h.p. Gnôme, with 2,100 metres.

The Easter Meeting at Hendon.

Given reasonable weather the "First London Aviation Meet" at Hendon promises to be a great success, the more so as, owing to the curtailed train service, so many people will be spending the holiday in Town.—It's an ill strike that does nobody any good.

The list of competitors cannot be known in full at the moment of going to press, but the following are practically certain starters:—

Mr. Gustav Hamel, who hopes to have one of the latest racing Blériots over in time, but who will in any case fly one of the "cross-country" type racers.

Mr. S. F. Cody, with his colossal 120-h.p. Austro-Daimler engine in his "Flying Cathedral," which he has entered for every event except the monoplane handicap and the "figure of eight" race.

M. Salmet, the hero of the Paris and back flight on another Blériot racer.

Mr. B. C. Hucks, who did so much fine flying in the West Country on a Blackburn, and who will make his debut as a Blériot flier.

Mr. Lewis Turner, a fine biplane flier, who was the first British pilot to take his certificate under the new conditions.

Mr. W. H. Ewen, the first man to fly across the Firth of Forth, prior to which feat he had flown from Lanark to Edinburgh over the dangerous Pentland Hills on the same little 28-h.p. Deperdussin racer which he will fly at Hendon.

Mr. T. O. M. Sopwith, who won the £4,000 de Forest prize by his World's Record flight from Eastchurch into Belgium on his Howard Wright biplane, and who will fly his 70-h.p. Blériot on which he won so many races in the United States last year.

Mr. H. Barber, whose splendid cross-country flights on the Valkyrie last year stamped him as one of our finest fliers, is also likely to compete, and as he has announced his intention of shortly retiring from regular flying, his first appearance in competition should be of exceptional interest.

Another probable competitor is Mr. Clement Greswell, who is one of the prettiest Blériot fliers in the country.

It is also possible that one of the latest type Bristol military monoplanes of the type bought by the Spanish and Italian armies, may make its first public appearance at Hendon, and if so, it should give a very good account of itself.

Several other competitors may materialise at the last moment, but if only those named actually compete they are of sufficient quality to make a very good show.

In the intervals between races Mr. Grahame-White himself will give exhibition flights on the famous 70-h.p. Nieuport with which he astonished the natives in the United States, and his flying by itself is well worth the trouble of going to Hendon to see, especially when, thanks to his courtesy, readers of The Aeroplane are admitted at half price to the Hendon Aerodrome on presenting the voucher which appears herewith.

Every item on the programme is worth seeing, and the only competition which appeared unduly dangerous has now been altered. This was the quick climbing competition, which has now been made into an ordinary altitude contest without a time limit.

Altogether Londoners may expect really fine competition flying on Friday, Saturday, and Monday next, and it will be equally well worth while to visit Hendon on Sunday, especially for those who wish to "take the air," for besides the non-competitive exhibition flying, there will be a great deal of passenger-carrying, and passenger flights at varying prices can be booked on the spot.

The End of the Mortimer Singer Competition.

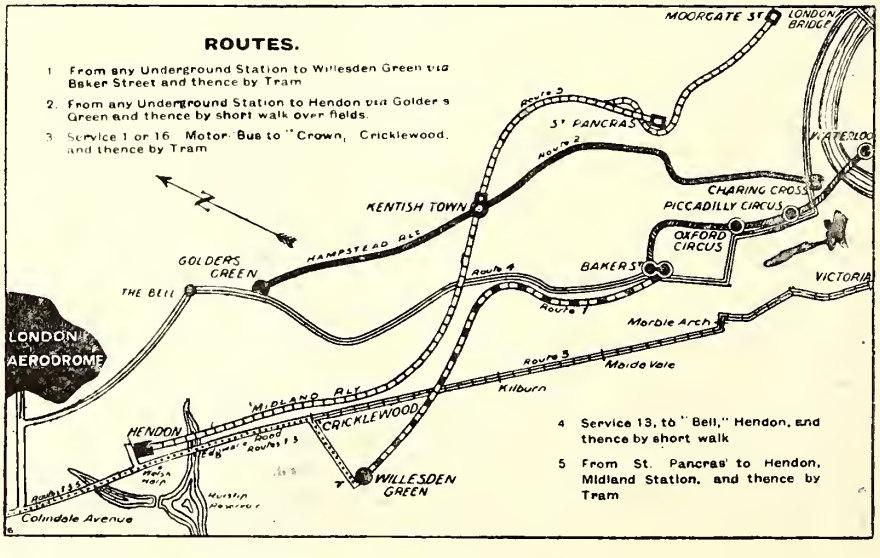
The competition for the Mortimer Singer prizes for naval and military aviators terminated on Sunday last, the winners being Lieut. Longmore, R.N., for the Navy, with 180½ miles, and Lieut. Barrington-Kennett, Grenadier Guards, attached Air Battalion, for the Army with 240½ miles. Mr. Longmore flew the Short tractor biplane with J. O'Connor, E.R.A., as his passenger, and Mr. Barrington-Kennett flew a Nieuport monoplane with Corporal Ridd, R.E., Air Battalion, as passenger.

The bad weather of the past week prevented any attempts being made by the various other competitors who were more or less ready to start. Lieut. Parke, R.N., on the Avro biplane, and Lieut. Bower, R.N., on the Bristol monoplane, would certainly each have put up very fine performances. Captain Loraine, Grenadier Guards, attached Air Battalion, intended to start with a Nieuport monoplane belonging to Mr. Robert Loraine, but had had no previous experience of this type of machine, though he is a remarkably fine flier on both the Blériot and Deperdussin. Captain Sykes, 15th Hussars, also intended to make an attempt on the latest of the Vickers monoplanes, but the machine had not had any opportunity of being regularly tuned up, so that neither Captain Sykes nor the makers expected a big performance unless they could have had several days' preparation at any rate. Everybody will congratulate the two winners very sincerely, both of them being most popular officers and exceedingly fine fliers.

Destruction at Windermere.

The Lakes Flying Company at Windermere had hard luck last week when both their machines, the *Waterbird* and the little monoplane, were destroyed by their shed falling on them through the gale which blew during the week-end. Unluckily both machines were thoroughly smashed up, but fortunately the engines were not damaged, so, though the accident means some annoying delay, one hopes that Mr. Wakefield and his assistants may soon be at work again.

HOW TO REACH THE LONDON AERODROME, HENDON.



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MESSRS. HARROD'S, LIMITED,

ARE INSTRUCTED TO SELL

BY AUCTION

At 2 p.m., WEDNESDAY, APRIL 24th, 1912,

AT THE PREMISES OF THE

Aeronautical Syndicate, Limited,

The Flying Ground, Collindale Avenue, West Hendon, N.W.,

Such of their entire stock of Aeroplanes, Engines, Supplies, Tools, etc., as remain unsold at that time. Much of the stock is quite new, and all is of the highest quality.

THE STOCK COMPRISES:

1 "Viking" Biplane fitted with 50-h.p. Gnôme, twin propellers, tanks, gauges, altimeter, etc.; in flying order and practically new. Speed about 50-55 miles an hour Carries pilot and passenger, and approx. five hours' supply of fuel. Very strongly built and well finished. Excellent machine for school work and passenger carrying. Engine and other parts may be sold separately.

1 almost new two-seater "Valkyrie" Monoplane, fitted with quite new 50 h.p. Gnôme. In perfect condition and flying order. Speed approx. 60 miles an hour. Engine and other parts may be sold separately.

1 single-seater "Valkyrie" Monoplane, fitted with exceptionally good 35-45 h.p. four-cylinder Green engine, and spiral tube radiator. Dual ignition, Claudel-Hobson carburettor. Speed approx. 45 miles an hour. In excellent condition and flying order. Engine and other parts may be sold separately.

1 new three-seater "Valkyrie" Monoplane, fitted with new 60-80 h.p. four-cylinder Green engine, and spiral tube radiators. Dual ignition, Claudel-Hobson carburettor. A splendid engine, exactly similar to the one lately winning the Mortimer Singer 24 hours' competition. Machine has been through its trial flights. Especially suitable for school work and passenger carrying. Engine and other parts may be sold separately.

1 partly finished Biplane designed for this year's Army Competition.

New spare parts for 50 h.p. Gnôme, as follows:—7 complete inlet valves, 11 sets inlet valve springs, 9 inlet valves, 6 inlet valve weights, 1 inlet valve seating, 16 inlet valve washers, 8 exhaust valves complete, 2 exhaust valves, 61 exhaust springs, 11 large exhaust pins, 6 small exhaust pins, 1 exhaust valve hook, 7 exhaust valve spring pins, 8 large exhaust valve rings, 15 small exhaust valve rings, 7 oil retaining rings, 7 piston rings, 5 valve rod pins, 2 oil gauge glasses, 4 contact carbons, 1 rev. counter belt, 1 camp case cover, 1 screw exhaust gland. 1 five-gallon brass tank with half-round ends, 4 six-gallon brass tanks with half-round ends, 1 twelve-gallon brass tank with half-round ends, 1 one-gallon brass tank with half-round ends, 1 six-gallon brass tank with pointed ends, 2 six-gallon copper tanks with pointed ends, 1 fourteen-gallon copper tank with half-round ends, 2 eight-gallon brass tanks (odd shape), 1 ten-gallon brass tank (odd shape). 2 Clift compasses. 2 new propellers for 50 h.p. Gnôme, 2 slightly used propellers for 50 h.p. Gnôme; all 8 ft. 2 in. diameter by 5 ft. 2 in. pitch. 1 new propeller for 60-80 h.p. Green, 8 ft. 6 in. diameter by 5 ft. pitch; 1 slightly used propeller for 60-80 h.p. Green, 8ft. 6in. diameter by 5 ft. pitch; 1 propeller for 35 h.p. Green, 7 ft. 6 in. diameter by 4 ft. 6in. pitch. 13 aeroplane wheels with tyres, 28 in. diameter by 2 in., with 6 in. hubs. In perfect order and practically new. Large assortment new and slightly used covers and tubes, 28 in. by 2 in., and 26 in. by 2½ in. Large assortment new and slightly used Farman type rubber shock absorbers, and 6 new aero-metal drums for same. 1 new four-cylinder Simms magneto, 1 new White and Poppe Carburettor, for 25 to 40 h.p. 2 60 h.p. Green carburettors. Quantity of new brass-plated Farman-type rudder and elevator control levers. 1 one-gallon Petrolia brazing lamp, 1 spoke-screwing machine, 1 bench drilling machine, 1 treadle tool-grinder, 1 wood-steaming plant with portable boiler, 1 portable forge, 1 smith's anvil, 1 shearing and punching machine, 1 grindstone, 1 pair bench shears with 9 in. jaws, 4 large fitter's vices. 1 breast drill, 1 Miller's Fall hand drill, 1 15 in. shifting spanner, 9 G. cramps, 1 metal melting pot, 1 sledge hammer, 10 box spanners, 2 copper soldering bits, 3 hack saw frames, 4 fire pots, 2 glue pots, 4 iron buckets. 6 large, strong carpenter benches, fitted with 6 large vices. 1 large table (14 ft. by 6 ft.) on trestles, 8 sawing stools, 8 trestles, 3 pairs of steps. 2 plummer blocks, with shaft, fitted up to test truth of propellers. Assortment of sheet steel. Assortment of steel tubing, 8 ft. 6in. length phosphor bronze tubing, 1 in. diameter by 1-16 gauge, suitable for control levers when near compass. Large assortment of new aeroplane wire, in all gauges from 10 to 18, Fredk. Smith & Co.'s G quality; quantity new best quality flexible control wire. Large assortment of bolts and nuts; wood screws; new wire strainers, 2½ in., 3 in. and 3½ in.; stocks and dies, from 14 gauge to ⅝; plugs, springs, pulleys, copper wire, nipples, rivets, clips, ferrules, tacks, emery paper, nickel-plated sockets, 5 gross wheel spokes, 9 6 in. hubs, steel clips, quantity of brazing wire, etc., etc., etc. 3 metal propeller fittings with bolts. 4 new petrol pumps, 4 new pressure gauges. Large assortment strong light aeroplane seats, and cushions. 2 tyre pumps. 1 iron box with padlock, 3ft. 2 in. by 3 ft. by 1 ft. 8 in. 2 five-gallon paraffin cans, 1 iron water barrel (about 30 gallons), 1 large oil tray. 1 strong trolley, 7 ft. 6 in. by 2 ft. 1 40 lb. fly-wheel (20 in. diameter), and several Gnôme engine frames. 250 ft. of quite new ½ in. by 18 gauge steel strip for wing stays or inner bracing. About 60 yds. new aeroplane fabric. 5 oil stoves, 1 smokeless fuel stove, 18 paraffin lamps with duplex burners, 2 naphtha lamps. Assortment aluminium and copper sheet and copper tubing. Quantity good dry silver spruce and Honduras mahogany. 1 100 lbs. spring balance, 2 alarum clocks. Quantity Vacuum A oil, about 90 gallons castor oil, 3 gallons Émaillite aeroplane varnish. Large quantity electric light leads, 14 32 c.p. Osram lamps. 1 first-aid cabinet and contents. 2 two-volt accumulators. 1 four-volt accumulator. 23 deck chairs in excellent condition. 1 packing basket for Gnôme engine. 1 fuselage suitable for either biplane or monoplane. 1 five-seater Ford motor car, in excellent order, and run only 1,700 miles; all accessories, and side doors in front; good as new. Clift maps of routes from (1) Brooklands to Edinburgh *via* Hendon and Harrogate, (2) Edinburgh to Brooklands *via* Glasgow, Manchester, Bristol, Exeter and Shoreham, (3) Hendon to Cambridge, (4) Hendon to Paris *via* North London, (5) Hendon to Shoreham *via* Brooklands. Also 2 map cases. Other goods too numerous to mention.

Catalogues and Orders to view may be obtained upon application to the Aeronautical Syndicate, Ltd., The Flying Ground, Collindale Avenue, West Hendon, N.W., and offers to purchase privately will be entertained up to the time of the Sale.

Everything must be cleared off. No reasonable offer refused.

The opportunity of the year for Aeroplane Builders, Aviators, and others.

TELEPHONE: KINGSBURY 24. TELEGRAMS: "AEROVALKY," LONDON.

The Week's Work.

Good Flying on the Avro and a Smash—Signor Sabelli's Long Flights on the Deperdussin—Lieut. Bower's Plucky Attempts on the Mortimer Singer Prize—"Henrietta" Rediviva—Resurrection of the Sopwith Howard Wright—Captain Loraine's Somersault—Colonel Smeaton again Flying.

Monday, March 25th.

Brooklands.—At Avro School, Lieut. Parke, R.N., out testing Green-engined school machine in bad wind. No one else out.

Hendon.—Pupils have to get up very early in morning these days to be able to get any practice at all, so pupils at Blériot School turn up in full force at 6 a.m. Only time weather allowed pupils to practise was from 6 to 6.30 a.m., when Messrs. Aubert, Pothet, and Teulard each managed to put in one straight before wind rose.

Tuesday, March 26th.

Brooklands.—Lieut. Parke, R.N., testing Avro School Avro-Green, up 300 ft. to 400 ft., for quarter hour in puffy wind. Handed over to Mr. Setti, who did straights. Wind too bad for attempt on brevet.

At Bristol School, Mr. Pizey out with Lieut. Fielding teaching landing. Then latter for straights, and later for two circuits. Capt. Broke-Smith, R.E. Air Battalion, for two circuits solus. Both pupils later on another circuit each.

At Sopwith School, Mr. Raynham up teaching Mr. Hedley, and then with Mr. Lang as passenger, testing a pair of new propellers in fifteen an hour wind.

At Deperdussin School, Signor Sabelli on racer for 20 mins., and Mr. Petre two circuits.

Brighton-Shoreham.—Mr. England, on Collyer-England, biplane, after putting up several straight flights, flew up ground, made left-hand turn, and returned to shed without descending. Mr. H. T. Smyth-Newton also took machine up several times, and pronounced her to be most comfortable and remarkably steady.

The Plain (Bristol School).—M. Prier out on monoplane and M. Jullerot on biplane, making eights in spite of gusty wind. Later on Mr. Hotchkiss out with Lieut. Jennings, but returned on account of *remous*. M. Prier again up on monoplane, but descended at Fargo for switch adjustment. Mr. Hotchkiss took mechanic over to M. Prier, latter afterwards making fine flight back to hangars. Mr. Pixton up with Lieut. Hall, but still found *remous* very strong. Later in morning M. Jullerot made couple of trial flights.

Wednesday, March 27th.

Brooklands.—At Avro School, Lieut. Parke, R.N., on military Avro-E.N.V. up to 2,000 ft., in very strong but quite steady wind, machine apparently almost standing still. Height reported erroneously in daily Press as 4,000 ft. Later took up Mr. P. K. Turner, of The Aeroplane; engine failed over track, landed in straight, machine lost steerage way, rolled into edge of track, dropped 8 ft. onto fence below; total damage, point of skid bent. Machine taxied back under own power. Evidence of strength.

At Bristol School, Mr. Pizey testing with Lieut. Mackworth. Mr. Merriam also up with Lieut. Mackworth. Too windy for pupils alone.

At Sopwith School, Mr. Raynham testing Wright.

At Deperdussin School, Signor Sabelli out in morning 25 mins., and in evening 45 mins., on racer. Excellent flying for little engine.

Hendon.—At Blériot School, half hour's practice from 6.30 to 7 a.m., by M. Aubert, who, alternating with MM. Teulard and Clappen, put in three straights.

Weather so bad most of the week as to make outdoor work impossible at Grahame-White School. In spite of 25-mile wind, however, Mr. Lewis Turner took out biplane No. 2 and put in 15 mins. at straights and circuits, but had to abandon further work and retire to works for theoretical instruction to pupils.

The Plain (Bristol School).—Wind fully 25 to 30 m.p.h. all day. M. Jullerot out testing conditions for about 10 mins., while Mr. Pixton made flight with Lieut. Jenkins. Later M. Jullerot up for some visitors.

Thursday, March 28th.

Brooklands.—No one out. Gales and torrents.

The Plain (Air Battalion).—Work this week confined to sheds mainly. The Vickers machine out for tests to-day.

Friday, March 29th.

Brooklands.—At Avro School, Lieut. Parke, R.N., took out Avro-Green for test, lubrication trouble through uncoupling of pump-pipe stopped engine, and laid it up for some days. No fault of engine.

Signor Sabelli on his Duperdussin.

At Bristol School, Mr. Pizey out with Lieut. Mackworth. Major Sir A. Bannerman a circuit in nasty wind. In evening Mr. Fleming out with Lieut. Mackworth, and Mr. Pizey on monoplane, flying very well.

At Sopwith School, Mr. Raynham instructing Mr. Hedley and Mr. Young, and later taking Miss Piper as passenger.

At Deperdussin School, Signor Sabelli put up fine flight of 62 mins. Longest flight done in this country by Y-type Anzani, or by machine of such low power. Excellent tuning of engine great credit to Mr. Petre and staff, and flight itself confirms high opinions already expressed of Signor Sabelli's ability. He should now be tried on a bigger-powered machine, as he would certainly put up a fine performance, for he flies the little machine in quite high winds, which keep all but the best men on the ground.

The Plain (Air Battalion).—Vickers again out testing, and it was decided to change wings.

The Plain (Bristol School).—M. Jullerot out for trial, but wind too strong. Mr. Gordon-England up later. At 7 a.m. Lieut. Bower, R.N., started for Mortimer Singer Prize on monoplane. Wind too great, and had to come down. Landed with wind behind on upward slope of hill at 90 m.p.h. Ran over top and half mile down other side, finally falling into sunken road and only breaking a skid. M. Jullerot also out. Mr. Bendall up with a mechanic. Mr. England and M. Jullerot out making solos. M. Prier made splendid flight on military two-seater monoplane, Lieut. Antonini being passenger. Quickly rose to 2,600 ft. with gusts of 40 m.p.h., eventually landed with clever *vol plané*. In afternoon M. Jullerot made some good flights, during one of them making a trip from North Down Camp to Lark Hill. During one of Mr. England's flights wind was so strong that when he started to glide down from 300 ft. above sheds he came down vertically like a lift, and had to switch on to avoid landing on sheds.

Saturday, March 30th.

Brooklands.—At Avro School, Lieut. Parke, R.N., attempted to start for Salisbury with Mr. Sayers as passenger and full load of petrol, but could not get within 200 of normal engine revs., though doing circuits at 1,050 r.p.m., so decided to abandon attempt. Found carburettor jet choked, so no blame to engine.

At Sopwith School, Mr. Sopwith on Wright testing, but wind too bad for any pupils' work.

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At Spencer School, old McFie biplane now turned into modernised Farman-type biplane, should be in good order by Easter.

At Harnriot School, Mr. E. V. B. Fisher has rebuilt the elderly and respectable "Henrietta" for Mr. George England, with higher chassis to take bigger propeller. Machine looks quite smart, and engine is turning well, so should make useful school machine once more.

At Flanders School, school biplane now almost ready for work again. L. Howard Flanders, Ltd., now installed in good works at Richmond, and at work on machines for War Office. Also an experimental biplane to be forthcoming ere long, embodying some highly original ideas.

Sunday, March 31st.

Brooklands.—Nothing doing in morning. In afternoon, after heavy rain, wind dropped, and Bristol School promptly at work. Mr. Pizey out testing, and then up with Mr. G. S. Wilson, of *Edinburgh Evening News*, as passenger, doing pretty glide over sheds, and afterwards fancy switchbacks along river. Later good flying in puffy wind by Captain Raleigh, Lieut. Longcroft, Lieut. Fielding, and Lieut. Lawrence, Lieut. Fielding doing one circuit with get-off and banking like experienced pilot rather than a pupil.

At Deperdussin School, Mr. Petre on racer flying prettily, and then Signor Sabelli up for over half an hour up to 400 ft. to 500 ft., finishing with beautiful glide from 250 ft.

Mr. Charteris doing straights on ancient Howard Wright monoplane of Sopwith School, "running in" 40-h.p. A. B. C. Machine flies quite well, and wing curvature looks startlingly modern, showing Howard Wright *cum* Manning two-year-old designs to be far in front of contemporaries. Should do some really good flights when engine tuned up. Other Sopwith School machines "resting," Gnômes being dissembled for general overhaul for Easter flying.

Hendon.—Weather all week unfavourable for school work and pupils at W. H. Ewen School therefore greatly rejoiced at being able to get in three good hours' practice. After Mr. Ewen had tested air on school Blériot, he handed machine over to M. Dubois, who made a splendid steady flight. Mr. Apcar, Lieuts. Pennycuick and Kerrich, and Miss Prentice made great headway with rolling practice, all being able to make fairly successful straight rolls at first attempt, while at only second time on machine Lieut. Pennycuick made capital straight flight over full length of course. Mr. Gist (new pupil), who joined school during week, had first instruction in controls. M. Baumann and Mr. Warren both made several good flights, while Mr. Ewen was also out again and put up fine exhibition, lasting about half an hour, on 28-h.p. Deperdussin.

The Plain (Air Battalion).—Vickers again out, but made bad landing, breaking propeller, and did slight damage to undercarriage. Capt. Loraine out testing Nieuport, and after doing some rolling, intended to go for flight; but on preliminary run apparently kept tail too high, and front of skid tried to bore through little mound. Machine slowly and sedately stood on its head, remaining in that position till put right by willing assistants, after which it was put back for repairs.

The Plain (Bristol School).—Lieut. Bower, R.N., made another trial for Mortimer Singer Prize on monoplane with Lieut. Moore as passenger very early in morning, landing at Fargo. M. Jullerot and M. Prier out to his assistance on biplane No. 55. M. Prier flying monoplane back to sheds, while M. Jullerot took passenger on biplane.

At 6.14 p.m. Lieut. Bower started for duration flight. Wind very stiff at time, but he kept up over an hour, covering about 66 miles, and being forced to descend by hail-storm. M. Prier made good flight on monoplane, attaining 3,500 ft. in 19½ mins. with Lieut. Antonini. At same time M. Jullerot took Lieut. Edmunds (new pupil) for first tuition flight. Same pupil afterwards with Mr. Pixton for two trips, and managed lever in second flight. Colonel Smeaton made good flight on No. 66, as also did Lieut. Ashton. In afternoon Lieut. Ashton went for brevêt, and did four excellent eights with sharp banking, but had to descend owing to broken ignition wire.

The Fatal Accident at Eastchurch.

The death of the unfortunate seaman Pullen at Eastchurch last week was due to one of those extraordinary accidents for which no one can possibly be responsible. It appears that one of the naval aviators was about to start out on the triple-twin Short biplane, and, as is usual, the engines were being tested before starting, the machine being held back by wooden chocks in front of the wheels. All being in good order, the signal was given to remove the chocks, and Pullen ran forward to help do so. For some strange reason, instead of going under the wings alongside the tail-booms, he deliberately got inside the booms, and ran straight into the after propeller. The propeller hit him first on one arm, both blades striking him in succession and breaking across the centre. He was then struck on the head, presumably by the flat of one blade after it broke, as his skull was fractured but not cut as it would have been if the edge of the blade had caught him. By a strange coincidence he bore the same name, a very uncommon one, as Mr. Jack Humphrey's mechanic, who was so seriously injured when swinging the propeller of the Humphrey monoplane at Brooklands.

MISCELLANEOUS ADVERTISEMENTS

All Advertisements for this column should arrive at this office by 6 p.m. Monday, to ensure insertion.

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APRIL 5th, 6th and 8th,

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(weather permitting).

SUMMARY OF EVENTS:

FRIDAY, APRIL 5th.

2.30—3.30 p.m. PARADE OF AEROPLANES AND EXHIBITION FLIGHTS.
3.30—4.30 p.m. LONDON AERODROME 3-DAYS' GRAND SPEED CONTEST.
4.30—5.30 p.m. FAST AND SLOW PASSENGER-CARRYING CONTEST.
5.30—6.15 p.m. ALTITUDE CONTEST.

SATURDAY, APRIL 6th.

2.30—3.30 p.m. PARADE OF AEROPLANES AND EXHIBITION FLIGHTS.
3.30—4.30 p.m. FIGURE EIGHT SPEED CONTEST.
4.30—5.30 p.m. LONDON AERODROME 3-DAYS' GRAND SPEED CONTEST.
5.30—6.15 p.m. MONOPLANE HANDICAP SPEED CONTEST.

EASTER MONDAY, APRIL 8th.

12.0—1.30 p.m. PARADE OF AEROPLANES AND EXHIBITION FLIGHTS.
1.30—2.30 p.m. BIPLANE HANDICAP SPEED CONTEST.
2.30—3.30 p.m. LONDON AERODROME 3-DAYS' GRAND SPEED CONTEST.
3.30—4.30 p.m. CROSS COUNTRY HANDICAP RACE, HENDON—ST. ALBANS—HENDON.
4.30—5.30 p.m. RELAY RACE: BIPLANES AND MONOPLANES IN PAIRS.
5.30—6.15 p.m. ALTITUDE PASSENGER-CARRYING CONTEST.
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THE AEROPLANE

1D WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

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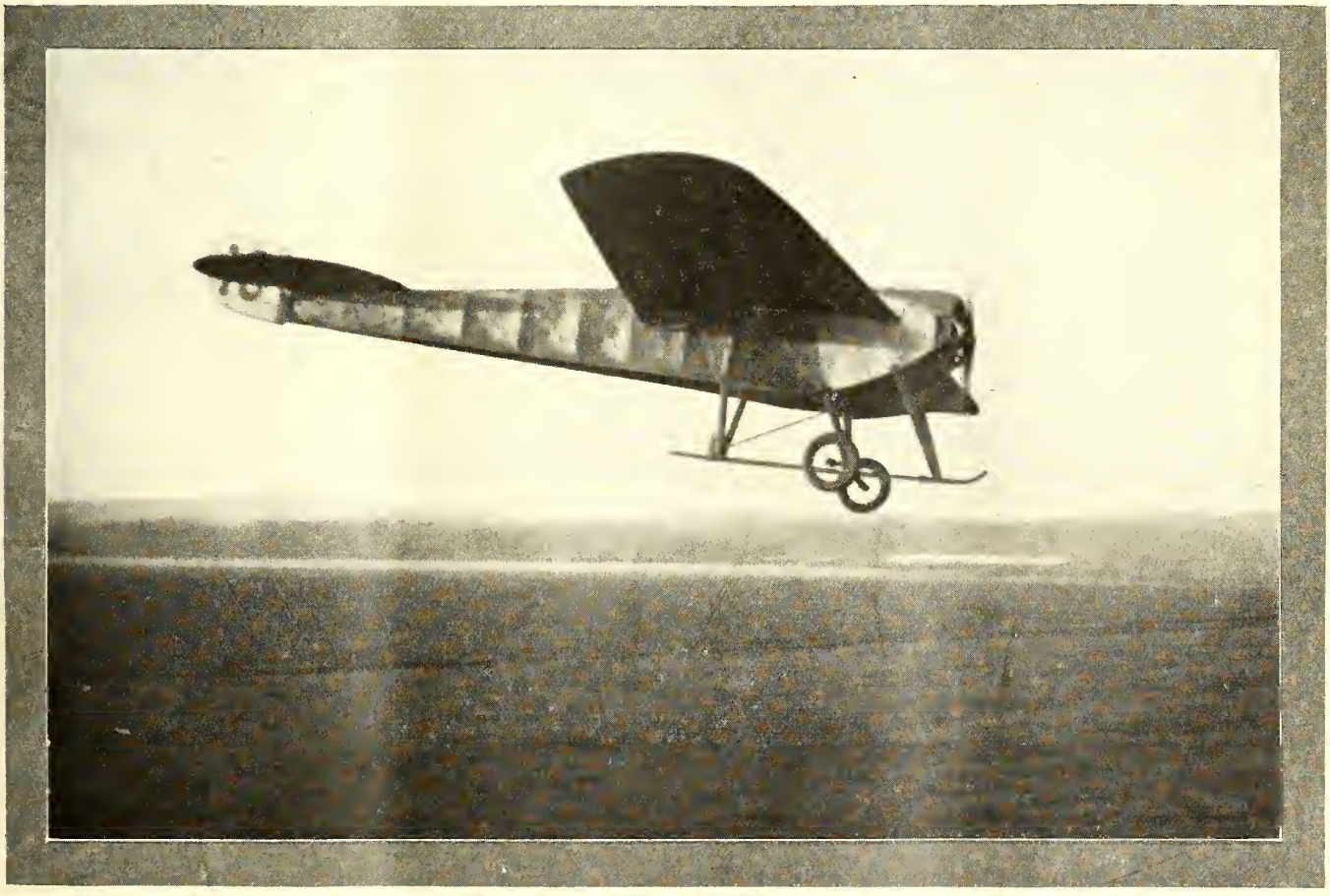
"SPEED!"



Mr. Claude Grahame-White flying his 70 H.P. Nieuport at Hendon during the First London Aviation Meet. When this photograph was taken the machine was travelling down wind at about 95 miles an hour.

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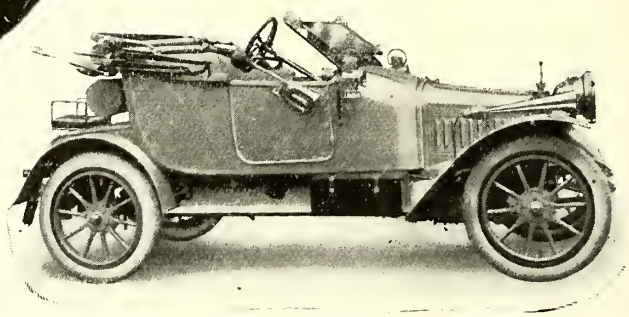

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MATTERS OF MOMENT.

THE ERRORS OF THE EXPERIENCED.

When one happens to be arguing with people as to the relative merits or demerits of different types of machines, more especially when it is a question of whether the tractor biplane or the box-kite is the better, one is often met with the reply that So-and-So says that such-and-such a type is far and away the best, and he ought to know because he is a certificated aviator.

On the face of it this "*experto crede*" argument appears almost unanswerable, because obviously the man who uses a machine ought to know more about it than those who do not. As a matter of fact, it is the worst possible argument, because, on the principle of "What can he know of England who only England knows?" the man who flies one particular machine is the worst possible judge of whether that machine is right or not. He is used to that particular type, he is used to that particular machine, and, owing to the unfortunate adaptability of the human being, he has got so accustomed to it that even something very much better seems to him very much worse.

An Analogy.

Very much the same thing has happened time after time during the last few years. People who rode the old high bicycles and got used to them argued that the safety was dangerous because one could not steer it with one's feet; and people who rode solid-tyred safeties said that the pneumatic tyre was dangerous because it might burst or puncture and throw one off the machine.

When motor bicycles were seized with their first spasm of popularity the writer was particularly interested in advocating control from the handle bar by means of wires instead of by means of taps on the top tube of the machine. He was told that it was very much easier to steer the machine with one hand and handle the taps with the other, and that it was too confusing to have the steering and tap-twiddling at the same time on the handle-bar; also that wires might break, and, anyhow, one could not see what one was doing. The most rabid opponents of handle-bar control were the most expert motor cyclists, and yet to-day practically every motor bicycle has handle-bar control.

In the same way, when the early motor cars had the engines at the back, and a few makers started putting them in the front, the pilots of the older machines said that it was dangerous to have the engine in front, because if it caught fire the driver would certainly be burned at the wheel, and they always ignored the fact that if the front axle broke and the car came on its nose it generally turned upside down, and the weight at the back telescoped the driver. It is common knowledge that one motorist at least was killed in this particular way on the road between Coventry and Kenilworth. Various others were injured from time to time by their cars running into obstacles into which they themselves were pitched owing to their being right up in the front of the machine.

So to-day one finds pilots arguing quite happily that the box-kite machine is very much easier to fly and very much safer than the tractor biplane. Because it is easier to fly, provided there is no wind; because, being so extremely sluggish on its controls, it can wave about slowly in a moderate wind, and the pilot has time to see what he is doing; because, owing to the pilot's position on the edge of nothing, he can see the ground when landing, and so finds it easier in his early stages to land without breaking anything; because a pilot, after some tuition, is able to flop round an aerodrome and make a number of landings without serious damage; and because a few very brave, or very ignorant, pilots venture to make long cross-country flights on machines of this type, one is continually told that the type must be right, because the pilots say so.

As a matter of fact, constructors can always find pilots for any sort of machine for a few pounds a week each, and as the pilot almost invariably swears by the particular type of machine he happens to be flying, the average pilot's opinion on the subject is practically useless.

The Easy Way the Wrong Way.

If you give a pencil to a child a few years old that has just been taught its letters and tell it to copy the letters, it probably grasps the pencil like a dagger and proceeds to make marks on the paper, which may, if the child is clever, dimly resemble the letter it is supposed to be copying. It probably takes that child some years to learn to hold a pencil properly, and all that time it is thoroughly convinced that it is merely being taught the right way of holding the pencil because it is difficult, and not because it is actually the right way, and easier in the end. In the same way a man easily learns to fly after a fashion on a box-kite, but actually his attempts are no more like real flying, as it will be when the flying machine is properly developed in a few years' time, than are the dagger strokes of the child's pencil like real writing.

It is true that now aviation in general is past its third year the box-kite is steadily going out of favour and being supplanted by the tractor biplane and the monoplane, machines which are possibly more difficult to fly at first but really do fly when once the pilot has learned to handle them. The chief drawbacks to their general adoption so far have been, firstly, that they are generally much faster than the

ordinary box-kite, and are, therefore, more tricky to start and land in the earlier stages of tuition; and, secondly, that for purely military purposes it is not so easy to see below the machine, and consequently a number of officers are still in favour of sitting in front of the machine, regardless of consequences.

Both these difficulties, however, are quite easily got over. For purely school work a tractor biplane can be built to go as slowly as anyone may wish, so that it is just as easy to learn as the older type, and considerably safer. For observation purposes, in a properly-balanced machine, the pilot can be placed behind the engine, but still so high up over the lower plane that he can see over it quite as well as the observer on a box-kite can see when the pilot is sitting in front of him.

On monoplanes it should also be quite possible to place the engine lower and the pilot higher, so that the pilot could be brought farther forward, and the engine rather farther back, thus massing the weights and giving a much better view than at present. This would have the additional advantage that in placing the engine lower it would be possible to use a big geared-down propeller and so get much higher efficiency out of the machine.

It is much to be feared that unless the pilots themselves raise an objection a number of the obsolete and dangerous box-kite machines, many of them built abroad, may be planted on our unfortunate Royal Flying Corps—to give it its new name—for school purposes. Therefore, the writer takes this opportunity of impressing these facts on present and prospective members of that Corps.

The Value of the Pilot.

Although, perhaps, some of these officers may not set any particular value on their own lives, they should at least recollect that each of them has cost the nation a very fair sum of money to train, besides what they have cost their parents and guardians, and so their necks have a definite cash value. It is, therefore, their duty to the nation, purely from a patriotic point of view and without considering their personal inclinations in the least, to preserve those necks as intact as possible, and it is to be hoped that if any attempt is made to plant foreign box-kites on the country that the officer-aviators will protest as one man, not because they themselves are afraid of injury, but simply out of consideration for the national exchequer.

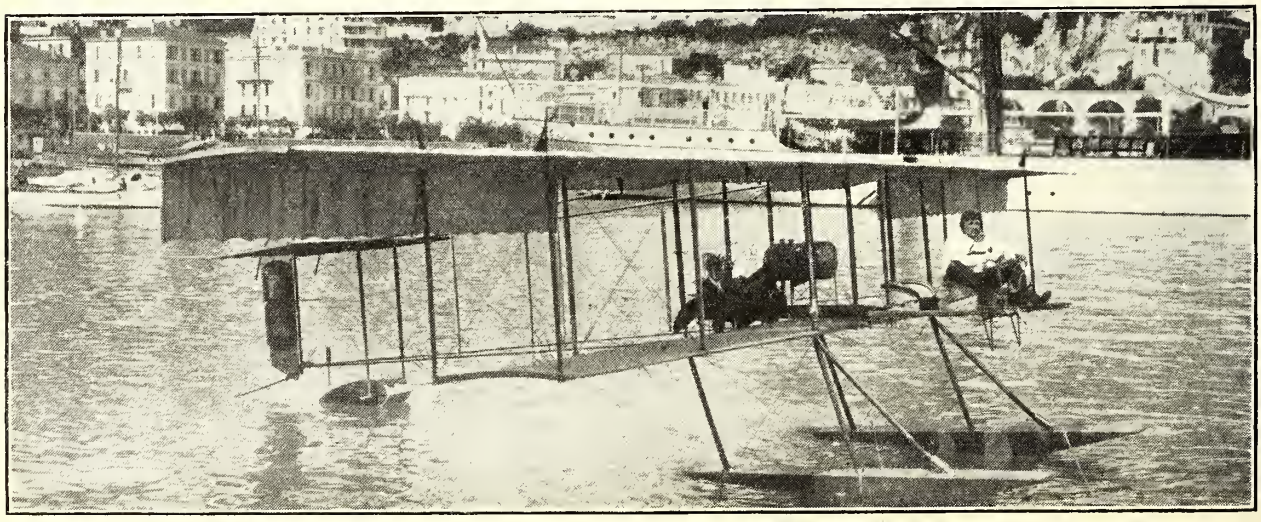
Unnecessary Risks.

Some military aviators are apt to set too much store on having a perfectly vertical field of view below them, and are even themselves prepared to take the risk of sitting on a horizontal ladder in the front of everything in order to obtain it. Their argument is that one has to take several risks on a military aeroplane in any case, and, therefore, another risk or two does not matter.

This seems to the writer to be altogether a mistaken argument. The central idea of military aviation should be that while recognising the fact that certain big risks have to be taken, the number of those risks should be minimised to the utmost. There is little use in sending a man up on a fast machine from which he has a perfect field of observation, if, after acquiring the knowledge for which he was sent out, he and the knowledge are going to be lost altogether through his running into a tree or hitting a wall after landing, which he is quite likely to do on the box-kite type of machine, or on any other machine on which the aviator is not protected.

It is also worth while remembering that in order to deliver important news in the quickest way possible it may be worth an air scout's while deliberately to pile up his machine in a wood, or even in the centre of a town, because the commanding officer to whom the message or news is to be delivered happens to be there, and because the nearest reasonable landing place may be a mile away, and so situated that landing there would delay the delivery of the news for ten minutes or a quarter of an hour.

The pilot of a properly protected machine can always smash his machine up without materially damaging himself, whereas the pilot sitting out on the front of a machine dare not take the risk, not because he is afraid of personal damage, but because he has the intelligence to know that if he is even stunned the message cannot be delivered. Consequently, taking it all round, the comparatively clear view obtainable by sitting in front of a box-kite machine may be bought at too high a price.



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PASSENGER FLIGHTS IN MONOPLANE OR BIPLANE.

The Central Flying School.

BY W. E. de B. WHITTAKER.

Colonel Seely, in his statement on the Army Estimates, after stating that the headquarters of the Royal Flying Corps would be on Salisbury Plain, proceeded to describe the Central Flying School, also stationed on the Plain. "Accommodation will be provided for sixty officers at one time. There will be three terms of four months each, and we propose to pass through, all being well, 180 officers in each year. In addition there will be non-commissioned officers and mechanics of various kinds." Then, after pointing out that officers must have taken their Royal Aero Club certificate before appointment to the school, he described briefly the course of training. "They will learn progressive flying, mechanics and construction in all its details, meteorological observations of the air, navigation and flying by compass, cross-country flights, photography from the air, signalling by all methods, and, most important, the types of warships of all nations. After this course, an officer—for he will be an officer of the Air Corps, whatever source he came from originally, whether Army, Navy, or civilian—will either join the military wing or the naval wing, or else he may go straight to the reserve."

It will be observed that officers before being selected for the school must have learnt the elements of flying elsewhere. The child invariably learns the signs of the alphabet before his actual school life begins, and the two cases are not dissimilar. The mere execution of a few erratic figures of eights on a calm day does not make one an aviator, it merely puts the seal on the first steps.

Real Flying.

The first lessons to be learnt at the Central School are in the art of flying generally. Flights should be made under all conditions, so that the aviator's experience shall be thorough and complete. Wind or heat, light or dark, nothing should find the military aviator at a loss. The ability to control an aeroplane with intelligence under adverse conditions is of more importance than the most minute knowledge of meteorology or the greatest erudition in the art of star-gazing. Not until a pilot's control of an aeroplane becomes to a great degree instinctive is he able to devote any space of time worth mentioning to the work of making observations, and it will be in the future a customary thing to send pilots up alone. This sort of flying knowledge can only be attained by constant experience in the air—it cannot be acquired by the most diligent study of textbooks nor by hours of devoted attention to "instructors" who have never flown, or whose knowledge of flying is confined to an hour or two in the air directing the sluggish wobbles of a box-kite biplane. So much for "progressive" flying.

Technical Knowledge.

The official mind connects the aviator closely with machinery of a complicated nature, and imagines in some strange way that before a man can fly well it is necessary for him to take active part in the construction of his aeroplane. So is it that future officers of his Majesty's Royal Flying Corps must be learned in the jargon of motorists, carpenters and tailors. It is advisable, if it is not essential, that officer-pilots should know of the simpler troubles likely to attack their engines, and of a few uncomplicated methods of making slight repairs to the structure of their machines. On active service any but the most simple repairs would place an aviator out of action at once, as the enemy have fundamental objections to giving assistance. A bad smash occurring within one's own lines could be dealt with by the trained staff of mechanics attached to each squadron of aeroplanes. So long as a pilot knows sufficient to be certain that his controls are in order and that the machine generally is in a fit condition to fly he knows enough.

Meteorology.

A knowledge of meteorology would doubtless be of the greatest use to officers of the Flying Corps. Personally, I have always had the deepest respect for those who could talk learnedly on this subject, and sincere admiration for those who understand the curly lines that disfigure otherwise excellent maps. Though a journalist, this is one of the subjects of which I know nothing, and can only pass it by in dignified silence.

Navigation a Necessity.

Thorough training in navigation and flying by compass is absolutely necessary. In the days when long cross-country flights were made at the height of a few hundred feet it was possible to fly entirely by landmarks. Even so, at least one pilot's life might have been saved by the use of a good compass and a slight knowledge of navigation. The advance of flying is such that flights are made at a height from which, if the slightest mist is hanging about, it is impossible to steer accurately by watching the ground.

It will be necessary that long cross-country flights to stated places should be made in order to gain experience in getting from point to point by compass. The making of innumerable cross-country flights is necessary for the gaining of general flying experience. Aerodrome practice may produce an aviator of great finish, but just as circus equitation does not produce riders of brilliancy in the hunting field so is the aerodrome not the best school for cross-country work.

The capacity to judge immediately on suitable landing places in cases of engine stoppage is a matter requiring constant practice. Again, in no other way can even the dimmest idea of the contours of the land be gained. It is a matter of extreme difficulty to realise that one is flying over rolling ground until one has had considerable experience.

Observation Practice.

Training in observation could take place at the same time as practice in cross-country flying. Officers, particularly those drafted from the Navy and from civilian sources, should fly day by day over troops; taking notes on their numbers, and trying to work out the point of concentration. To distinguish the various branches of the Service from a height of two or three thousand feet is by no means so easy as it seems, even to a soldier of some years' service. Similar exercises in the direction of gun-fire should be undergone, as are taking place day by day at Mailly, in France.

Signalling.

So far little signalling has been attempted from aeroplanes, and the entire system and code has yet to be created. The use of the Morse Code by means of puffs of soot has not proved a great success, and it is hard to devise any efficient method of semaphoring. Wireless telegraphy is probably the solution of the difficulty, though at present the great weight of the apparatus is a bar to its use.

Sketching.

Military sketching will form a part of the course. As may be imagined, it will be rather a different business from sketching under land conditions. Profile sketches are possible if made on approaching the tract to be sketched. When one is directly over a piece of country it is only possible to make a rough plan. If large scale maps are available it is only neccssary to add on the map itself such additional detail as may be desired, such as the position of the enemy, etc.

Soldier Mechanics.

The training of soldier mechanics is also of importance. Whatever the British mechanic may be he is not systematic nor business-like. Frequently one sees half-a-dozen men at work on a job requiring one man only. A certain number of accidents has been due to the gross carelessness of the workmen employed on the

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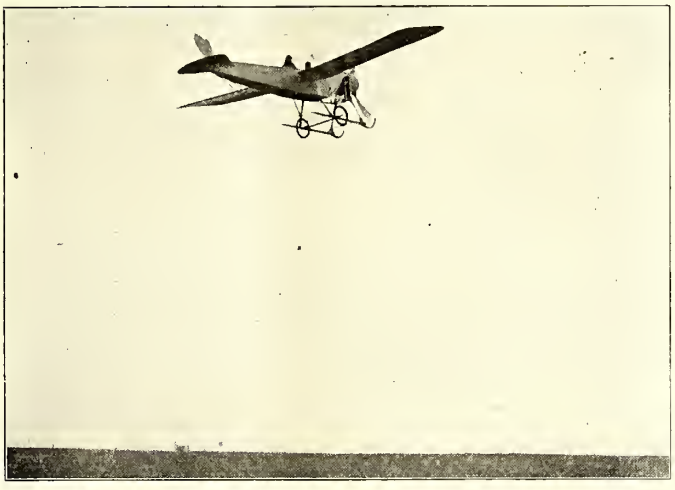

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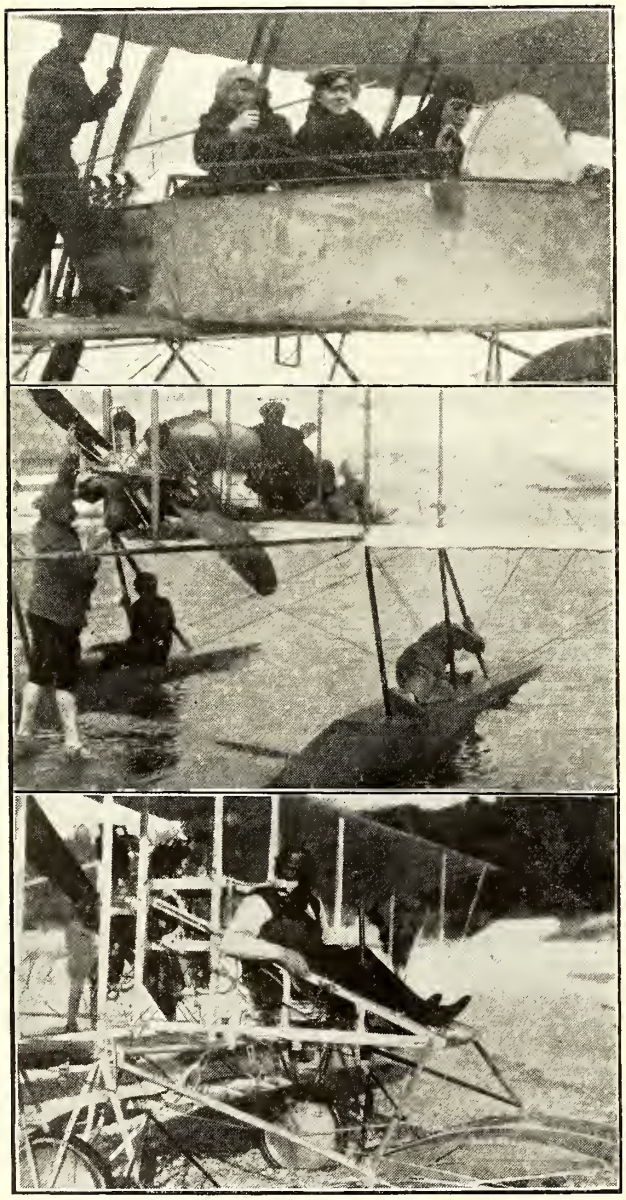
job. As the aeroplane squadrons will certainly not be over-staffed such mechanics as are attached will have to work with due regard to system. Military discipline and rigid training will make a change.

Nothing is laid down as to the course to be pursued in, according to Colonel Seely, "the most important" subject of all, the learning of "the types of warships of all nations." Whether it will be done by means of subscriptions to picture-papers or the purchase of popular picture books on the Navy is not stated. In any case there is distinct promise of amusement.

The Need for Tact in Command.

The School has a great future before it if it is placed under officers who combine large practical knowledge with tact, but on them will depend the avoidance of the dangers of discord between the Services. A writer in a provincial paper has seen fit to disagree with what has been written in this journal as to the danger of such friction occurring, his argument being that if a man is paid for certain work he is bound to do it. This writer is apparently ignorant of two very important facts, firstly, that an officer's pride in his own Service is apt to make him somewhat touchy on the subject of slights, intentional or otherwise, put upon him or his men by the other Service, and that, so far as the Army is concerned, an officer is not paid for his work, but merely receives a paltry stipend from the Government which may possibly, with the strictest economy, enable him to maintain his existence, and, as he generally has a private income, he only remains in the Army because of his pride in his Service. Given these two conditions all the ingredients for disagreement exist, and anyone with experience of stations which are at once garrison towns and Naval ports knows the tact necessary in the officers who are to control such a composite corps.



Above, Renaux and passengers. In the middle, Fischer and three passengers. Below, Caudron on the Caudron-Fabre amphibian which performed well.

The Monaco Hydro-Aeroplanes.

From Monte Carlo comes a batch of photographs sent by Mr. H. J. D. Astley, accompanied by terse but enlightening comments. The Farman which won the competitions is a "horrible affair," but of the Caudron he says it "is a ripping little packet—goes like smoke with an 80-h.p. Anzani—and a very good amphibious undercarriage." Fischer, the Henry Farman pilot, carried two of his three passengers on the floats, and Mr. Astley says that these two mechanics came in like drowned rats. Of the Canard he says, "This 'bus is very unstable in every direction, and both the Canards have been smashed up—bad machines and bad pilots." Mr. Astley is evidently a great admirer of Renaux, the pilot of the Maurice Farman biplane, whom he describes as about the best biplane flier he has ever seen. He says the machine is by far the best glider he knows of, in spite of staggered planes, and it got off the water every day with four heavy passengers.

The Monaco meeting ended on March 30th after ten days of perfect flying weather. No serious accident occurred to mar the placid serenity of the proceedings. The Voisin of Colliex on the second day overturned and gently collapsed into the waves. The passengers were unhurt, though the pilot was annoyed. Various causes eliminated several of the competitors, and in the final general classification only five machines appeared. They were as follows:—

(1) Fischer, Henry Farman biplane, 112 points.
(2) Renaux, Maurice Farman biplane, 103 points.
(3) Paulhan, Curtiss biplane, 86 points.
(4) Robinson, Curtiss biplane, 71 points.
(5) Caudron, Caudron-Fabre biplane, 65 points.

After the serious affairs of the meeting were over the pilots, with the sprightliness of young children, disported themselves high in the air over the bay, accompanied as passengers by carefully selected representatives of local youth and beauty. Curiously, at one time four of the pilots flying had with them personages whose names bring back memories of the early days of aviation—Archdeacon, Fournier, Dubonnet, and Féquant going up as pasengers with Henry Farman, Fischer, Renaux and Caudron respectively. M. Blériot also made an aerial journey, piloted by Henry Farman, and was impressed by the stability of a biplane. Old rivalries were forgotten, and only the pleasure of the moment counted at all. The papers gave a varied and multi-coloured list of quaint English semi-celebrities who by means of money also took the sea air after the modern style.

Hydro-aeroplaning at Barrow.

Mr. Sydney O. Sippe, who will be remembered as flying the Avro exceedingly well at Brooklands, has lately been experimenting with Commander Schwann's hydro-aeroplane at Barrow-in-Furness, and has succeeded in making it fly.

Writing on April 2nd, just too late for it to be possible to get the news into last week's Aeroplane, Mr. Sippe says that he made some successful trial flights at 5 a.m. that morning. There was a breeze about 10 m.p.h. blowing at the time, which did not improve matters. He managed to get in three good straight flights against the wind, the machine rising easily and getting up speed very quickly. Mr. Sippe says that Barrow is a very windy place, and it does not seem likely that they are ever going to have a calm. He has found it necessary to fit a water rudder, as the machine is very unwieldly when there is any wind blowing and not much speed on. Results of his further experiments are awaited with interest.

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The Week's Work.

Monday, April 1st.

Brooklands.—No flying. Bad wind.

Tuesday, April 2nd.

Brooklands.—At Bristol School Mr. Pizey up at 400 ft. testing with Lieut. Mackworth. Major Sir Alexander Bannerman for a circuit. Mr. Mackworth doing straights solus, and later as passenger with Mr. Pizey.

At Sopwith School Mr. Raynham up on Wright about 20 mins. with Mr. Howard Wright, Mr. Snowden Hedley, and "Joe," flying well in bad weather.

At Deperdussin School Signor Sabelli out for a circuit on racer.

Hendon.—At Blériot School Mr. Tremlett made three circuits, and Mr. Pothet one circuit. Mr. Aubert did four straights and Mr. Clappen one straight.

Weather conditions favourable, and a fair day's work possible. In early morning Mr. Lewis Turner put in about 1 hour at circuits on biplane No. 2, flying at about 200 ft. in a 20-m.p.h. wind. Mr. C. Grahame-White out on same machine in afternoon, giving exhibition flights and afterwards taking up three lady passengers.

The Plain (Bristol School).—Mr. Pixton up testing new two-seater monoplane just received from Filton. Quickly attained good height, landing in beautiful *vol plané*. Mr. Hotchkiss and M. Jullerot also out giving lessons to Lieut. Edmunds, Mr. Jennings, and Lieut. Ercole, Mr. Bendall taking Lieut. Hall. Mr. Hotchkiss gave Mr. Jennings a trip, afterwards ascending on Anzani-Bristol monoplane. Lieut. Wyness-Stuart also out on monoplane, as also Lieut. Ercole, whilst Mr. Pixton took Señor Campaña for a flight on biplane No. 55.

Wednesday, April 3rd.

Brooklands.—At Bristol School, Lieut. Mackworth as passenger with Mr. Pizey, and after doing circuits alone. In evening, Mr. Fleming testing, and Lieut. Fielding and Mr. Nesham doing eights. Mr. Pixton arrived from Salisbury on military two-seater monoplane, with Lieut. Ashton as passenger. Reported excellent journey, but did not admire country between Farnborough and Woking, as he could not see a landing place. Certainly this is one of worst pieces of country in England. Always advisable to keep to north towards Staines.

At Sopwith School, over an hour's flying in morning, Mr. Raynham on Wright taking up Mr. Young and Mr. Hedley for tuition. Then Mr. Sopwith on Wright with Mr. Hedley, and later starting for Hendon on Blériot with Mr. Hedley as passenger. In afternoon, Mr. Raynham again up on Wright teaching Mr. Howard Wright and Mr. Young for over half an hour.

At Deperdussin School, Mr. Petre circuits on racer. Mr. Gill also circuits on brevêt machine at 70 ft. Signor Sabelli also out. In afternoon, Mr. Turner rolling on taxi, slightly damaged chassis. Later Mr. Petre and Signor Sabelli both flying well.

At Hanriot School, Mr. E. V. B. Fisher brought "Henrietta" out for first time since rebuilding, and found she was flying beautifully, and climbing better than when new.

At Herbert Spencer School, Mr. Spencer testing rebuilt MacFie biplane and doing straights.

Hendon.—A perfect flying day, and school busy from early morning till dusk. Mr. Hucks opened the day's work on Blériot monoplane No. 4, doing circuits and figures of eight. Mr. Turner, on biplane No. 2, engaged at circuits with Mr. Morris and Mr. Roupell (two new pupils) in the passenger seat in turn, afterwards doing a solo flight over the Welsh Harp and back, and then up with Mr. Roupell. Mr. Gates out on same machine, doing several circuits. Messrs. Manton, Morris, and Major Lisles all out rolling on biplane No. 3 in the afternoon. Mr. Lewis Turner out on monoplane No. 4 doing circuits, afterwards returning to biplane No. 2, making eight passenger flights before turning the machine over to Mrs. Stocks (this afternoon seeing her return, after a three months' tour abroad, in which she has been indulging since obtaining her brevêt), who flew several circuits in her usual professional way. During the morning Mr. T. O. M. Sopwith flew over from Brooklands on his 70-h.p. Blériot and during the afternoon made two flights with a passenger, banking wonderfully and executing a marvellous spiral *vol plané*. Mr. Grahame-White also had his 70-h.p. Nieuport brought out and gave a 15-min. exhibition flight, flying very low and banking in his usual way, afterwards making a flight over the surrounding country and landing *en vol plané*. Afterwards out on biplane No. 2 with a passenger, flying over Edgware Road, returning then to take up one more passenger before handing the machine over to Mr. Biard.

At Blériot School Mr. Tremlett made three circuits and Mr. Pothet four straights and one circuit. Mr. Aubert did 15 straights, Mr. Clappen eight, Mr. Welburn six, Mr. Teulade four, and Mr. Thomson three.

Mr. Barber making farewell flight on Valkyrie racer in beautiful style across country very high up, and a pupil out on school Valkyrie also.

Ideal conditions for school work all day. Pupils of W. H. Ewen School got in big day's work on Blériot.

Rhyl.—Mr. Hewitt left the aerodrome at 4.55 p.m., and circled round till 5.30. Then landed on shore till 5.45. Hundreds of people came flocking round to examine machine. Leaving shore at 5.45, he flew over town and shore till 6.15, when he landed at aerodrome.

The Plain (Bristol School).—M. Jullerot out on monoplane. Mr. Gordon England at same time on biplane No. 55. Mr. Pixton started school work by ascending with Lieut. Edmunds on monoplane. Lieut. Antonini doing good solo on another school monoplane. Señor Campaña practising on school biplane, Lieut. Freeman making two good solos on No. 55. M. Jullerot giving lessons to Lieut. McArthur and Mr. Jennings. Mr. Gordon England also taking Lieuts. McArthur and Edmunds, Mr. Bendall flying with Mr. Jennings. Colonel Smeaton performed fine solo, making a graceful landing, after which Mr. Pixton, with Lieut. Ashton as passenger, set out on Bristol military monoplane for Brooklands, the news arriving later that he had successfully arrived, having covered the distance of about 60 miles in under an hour. Lieuts. Wyness-Stuart and Ercole and Señor Campaña all out for practice. Two other pupils, Mr. Jennings and Lieut. Edmunds, made their first solo flights, both landing very well. It is interesting to note that Lieut. Edmunds only joined school just under a week ago.

Further work in evening after Mr. Hotchkiss had made a trial. Lieut. Freeman passing tests for first part of certificate, and Lieut. McArthur showed good progress in solo flight on No. 43. Lieut. Edmunds gave further evidence of ability in two solos on biplane No. 66. M. Jullerot, Mr. Gordon England, Mr. Jennings, and Colonel Smeaton also out. 36 flights in all made during day.

Windermere.—Mr. Gnosspelius' machine not squashed as reported. It was the old biplane and some of the planes for the new biplane that suffered. This day Mr. Gnosspelius' machine was run down to Hill of Oaks hangar to be out of way of Easter crowd. She was a bit sluggish, and pilot picked her off too quickly, result—slight pancake and a big splash; only thing missing, however, was a slice of propeller.

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Thursday, April 4th.

Brooklands.—At Bristol School, Mr. Fleming testing, and then taking up Capt. Broke-Smith. Latter afterwards doing circuits in nasty wind. Mr. Pizey up with a passenger, and Mr. Fleming up alone.

At Sopwith School, Mr. Raynham testing Wright for 10 minutes.

At Deperdussin school, Lieut. Porte for 15 minutes on racer flying strongly in very gusty wind.

Mr. J. R. Duigan, the first Australian aviator, testing new propeller of own make on own Avro, doing straights only.

Friday, April 5th.

Brooklands.—Big wind. No flying.

Hendon.—Fine flying by Messrs. Grahame-White, Lewis Turner, and Gustav Hamel, as shown in report of London's First Meeting.

Saturday, April 6th.

Brooklands.—Nothing doing. A gale.

Hendon.—Splendid flights by Messrs. Grahame-White, Lewis Turner, and Hamel, described in report of London's First Meeting.

Sunday, April 7th.

Brooklands.—At Bristol School, all four machines out, two box-kite biplanes, one military two-seater monoplane, and the little Anzani monoplane. A really fine show for one school. Capt. Broke-Smith took certificate on biplane. First landing

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too far from mark, otherwise a good effort. Mr. Pixton on two-seater monoplane alone, and then with Capt. Broke-Smith. Capt. Allen doing circuits on Anzani monoplane. Lieut. Mackworth and Lieut. Fielding on biplanes flying well.

At Sopwith School, Mr. Raynham on Wright testing for 10 minutes. Then Mr. Young two solos of 10 and 15 minutes each. Later Mr. Raynham on Wright with Mr. Hedley as passenger flew to Hendon.

At Flanders School, Mr. Fisher out on rebuilt monoplane. Machine now with wings of greater chord, and apparently flying better than ever.

At Blondeau-Hewlett School, Lieut. Hewlett, R.N., out on Lieut. Snowden-Smith's little biplane, flying very nicely for first attempt on fast machine.

At Deperdussin School, in afternoon fine flying by Mr. Petre, and later by Signor Sabelli on racer, latter up at 300 ft. to 500 ft. in strong wind, and handling machine beautifully.

Mr. J. R. Duigan out on own Avro, now tuned up, and doing circuits for first time, made three flights, 3, 3, and 4 circuits, a remarkable performance for first circular flights, mostly at 100 ft.

At Herbert Spencer School, Mr. Spencer out in great style over Addlestone and back by Byfleet, ex-MacFie machine flying capitally, but rather down by the tail.

In evening quite a pretty display in spite of puffy wind. Mr. Valentine and Mr. Pixton both up on Bristol military monoplanes at same time, former at about 2,000 ft., coming down with magnificent straight glide from over Addlestone, and latter flying very steadily at 1,000 ft. Mr. Fleming up on old "No. 7" biplane. Mr. Spencer out again, but tail rather down. Mr. Fisher for a couple of pretty circuits on Flanders.

Towards dusk Mr. Raynham on Wright with Mr. Young as passenger arrived from Hendon. Journey there took 24 mins. for 19 miles in comparative calm of morning. Return took 52 mins., showing strength of wind. Latter part of journey Mr. Young holding petrol pipe in position by hand, owing to vibration loosening joint. Mr. Raynham reported that over Ealing at 2,000 ft. they stood still against wind for nearly 10 mins., and had to come down to 1,000 ft. before they could make headway.

Hendon.—Magnificent flying by Mrs. de Beauvoir Stocks, Messrs. Grahame-White, Ewen, Hamel, Sopwith, Lewis Turner, Allen, Hucks and Raynham, fully reported in account of London's First Meeting.

Notwithstanding Flying Festival, W. H. Ewen's pupils put in three hours' good practice in morning. All pupils showing excellent progress. Lieut. Kerrich at second day on Blériot made excellent straight skim.

A Business Proposition.

A day or so after the appearance of this issue of The Aeroplane a proposition will be put before the public to subscribe to the British Deperdussin Aeroplane Company, Ltd. This is the first company to be floated on the strength of the awakening of the British Government to the importance of aerial defence, and there should be little difficulty in obtaining the £30,000 required, for the firm starts with excellent prospects. In the first place the Deperdussin monoplanes designed by M. Bechereau have already established themselves in competition with the finest machines in the world as being in the front rank, as shown in the French Military Competitions, and in the International Michelin Competition, besides beating numerous world's records. Secondly, the British Army has already acquired one Deperdussin which is highly approved by the practical fliers of the Air Battalion, and the British Admiralty has purchased another of more recent type, which proves that the firm is well in the running for further orders, and as M. Bechereau is one of the most progressive of designers it may be assumed that his latest designs will be such as to make purchases highly desirable by our Flying Corps. The directors of the new firm include Admiral the Hon. Sir Edmund Fremantle, G.C.B., C.M.G.; Colonel Wykeham Dickenson; M. Deperdussin—the head of the French firm; Lieut. J. C. Porte, late R.N.; and Mr. D. L. Santoni. These names should be sufficient guarantee that the firm will be run on honest and business-like lines. M. Bechereau is retained as technical adviser, and the British firm will have the benefit of all his newest designs as soon as they are produced, so that the latest machines will be built simultaneously in France and England. The shares offered to the public are 6 per cent. cumulative participating preference shares, the vendors—the British Deperdussin Aeroplane Syndicate—taking the purchase price in ordinary shares, and £4,750 in cash, which, in the writer's personal estimate, can scarcely cover them for their out-of-pocket expenses up to the present. Of course, no aeroplane venture can at this date be called a gilt-edged security, but someone has to build war-planes. Even our big shipbuilding and armament firms did not start business in their present affluent and dividend-paying state, so it seems fair to assume that a well-managed firm which is well in the running for Government orders is about as sound a speculation as one can reasonably expect.

With a Passenger to Paris.

The day after his return from Paris, Mr Gustav Hamel called on The Aeroplane and gave quite an interesting account of his trip with Miss Trehawke Davies. It appears that all went perfectly well till when about a mile from the French shore over Cap Grisnez, and at a height of over 6,000 feet, the Gnôme stopped suddenly. Mr. Hamel promptly put the nose of the machine down and dived for the land. When they got over the coast he said he could see nothing but rocks and sand dunes, neither of which make good landing places; presently he espied a little green patch well to the south of Gris Nez and made for it. Then he had to do several spirals to keep from over-shooting it, owing to the following wind, but he managed to make his landing there, and immediately borrowed a bicycle from a peasant who rode up, and cycled to Hardelot to send word of their whereabouts, for fear their friends should be anxious and send torpedo-boats out to search for them. He then cycled back to the field where they had landed, and proceeded to investigate their troubles, only to find that the only defect was that the pressure had been let down in the petrol tank. Miss Trehawke Davies, discussing the trip with the writer at Hendon last week-end, took all the blame on herself, and was most penitent about it. She had been put in charge of the pressure tank, and though she pumped till her arms ached it proved that her efforts were insufficient. She herself was the more disappointed of the crew, for she had set her heart on getting through to Paris without a stop. Miss Davies said that Mr. Hamel's spiral glide to reach that green spot was a really wonderful piece of flying, and, as she modestly put it, "I had plenty of time to sit still and watch him do it." Miss Davies was also full of admiration for Mr. Hamel's clever landing at Issy, where their arrival caused quite a sensation, for the wind was so bad that none of the French aviators were out.

Mr. Hamel said that their arrival at and departure from Hardelot was quite uneventful, as was their journey to Paris till they got quite close to the city. Here he took the machine up to about 7,000 feet so as to have plenty of height from which to make a landing. He kept over the west end of the city, though at that height he said the whole of Paris looked quite a little place, and he could have glided to either side of it. However, he kept his eye on the Bois de Boulogne on the right and Issy on the left, with the Seine between as a last resort, for the gauge-glass of the petrol tank showed there was hardly any spirit left, and he expected to make his final glide from somewhere over the Arc de Triomphe. Fortunately, the petrol lasted out, and they made a perfect landing at Issy, after crossing over the Eiffel Tower.

Miss Trehawke Davies and M. Norbert Chereau watching the flying at Hendon on Saturday.

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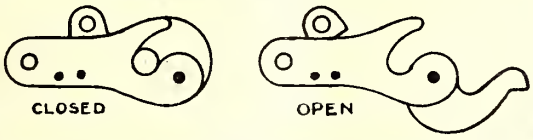

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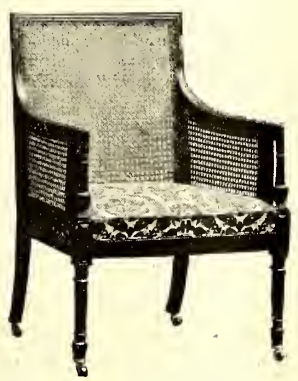

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London's Aviation Meeting.

Good Friday's Flying.

Even if the flying on the first day was spoiled by the wind so far as the quantity was concerned, the quality was such as one can scarcely expect to see bettered.

In spite of the innovation of having a meeting on Good Friday, or perhaps because of it, there was a huge crowd present, and both Mr. Grahame-White and Mr. Richard Gates looked very well satisfied with the results of their first day.

By 2.30 p.m., when proceedings were booked to commence, there was a 30-m.p.h. wind blowing, and a very gusty one at that. The "ananiameter," as the local humorists call the anemometer, registered continual gusts from 10 to 22 m.p.h., and at one time there was a dead calm for nearly five minutes, followed by a gust which went straight up to 25 m.p.h., so it will be seen that flying was about as dangerous as it could well be.

Of course, competition flying was out of the question, and, equally, of course, Mr. Grahame-White himself saved the situation by turning out just after 2.30 on the old Farman on which he flew to Birmingham last year, and giving a really wonderful exhibition flight. Even the crowd who did not understand were moved to enthusiasm by his masterly handling of the machine, which was pitched about in an astounding way, and seemed to be trying to get into all positions at once. To those who knew, the performance was more marvellous still, for the machine was old and tail-heavy, and so was very sluggish in her movements, but Mr. Grahame-White handled her as if she were of the most modern type.

Incidentally, before making his exhibition flight he took a new machine out for an airing, the machine being a Farman-type biplane fitted with ailerons like a Curtiss between the planes. Being new and untuned, he merely did a few hops, but the ailerons seemed to have a tendency to act slowly and then overdo it when they got to work.

After his fine flight a stentorian-voiced scoutmaster with a megaphone announced that the wind was too strong for the speed contest, but that Mr. Hamel would give an exhibition, which he did. His get-off with the wind behind was startling enough, and he only just missed hitting a pylon by a clever piece of flying, but when he turned and came back against the wind at a couple of hundred feet one got some idea of what the wind really was. His Blériot does quite 60 m.p.h. under ordinary circumstances, but it is doubtful whether he was actually doing 20 against the wind. In fact, at times it looked almost as if he was standing still. He turned somewhere over the Edgware Road, and came back like a flash, doing well over 90 an hour. Then he turned to make another circuit, and when he had got round facing the aerodrome he shut off his engine and did a steep glide with the wind behind, coming in over the sheds at an astonishing speed, and bringing the machine head to wind with a banked dive which was horrid to look at but remarkably clever. Actually that flight was one of the smartest pieces of flying in his career. When he was once up he seemed to be quite steady, but he told me, when he came down, that he got a most awful bumping over the Edgware Road, and was several times thrown right out of his seat.

Then after another wait, Mr. Lewis Turner brought out the old biplane and bravely did a couple of circuits, not perhaps with the wonderful finish of Mr. Grahame-White himself, but none the less remarkably fine flying. He had to work like a navvy the whole time, but he never made a mistake, and the performance puts him definitely in the same class with such a wind-fighter as Mr. Pixton.

After more waiting for the wind to drop, the man with the megaphone announced that Mr. Hamel would go for the altitude prize later on, and that there would now be "a short interval for afternoon tea," a humorous remark which was appreciated. Evidently the caterers had under-estimated the crowd, for the obtaining of tea needed the muscles of a rugger forward, the voice of a toast-master, and the conscience of a company promoter. However, with the able assistance of a gunner officer recently returned from the North-West Frontier of India, where the Pathans make a speciality of rifle-stealing, our party managed to acquire provender which was doubtless intended for someone else.

Then after a little while Mr. Grahame-White went out again and flew better than ever in even a worse wind. His Gnôme stopped for a moment at the far end of the ground, and it looked rather as if there was going to be trouble, but it picked up again and he did another fine but exciting circuit, which finished his flying for the day.

Considering that Mr. Grahame-White had no incentive to fly beyond his sense of duty to those who had paid to come into his aerodrome to see flying, every credit is due to him. Most men, with such a wind blowing, would have announced that flying was impossible, and would have left it at that. People do not expect to hunt in a hard frost, regattas are not held in gales nor in a flat calm, nor are cricket matches played in a deluge, and spectators must learn to take their chance of the weather.

Finally towards sunset Mr. Hamel went up for the altitude trophy, using Mr. Sopwith's 70-h.p. Blériot, as it is faster than his own and therefore more stable in a wind. This time he started against the wind and climbed straight out over the sheds. He made one turn back towards Hendon, and then climbed steadily in the eye of the wind for about 10 minutes. After that he turned sideways to the wind facing North, and we had a chance of seeing what the wind really was, for although up at over 3,000 ft., one could see that he was drifting sideways at well over 40 miles an hour. After being up about half an hour he came down with his engine running slowly, and landed beautifully, his aneroid registering just over 6,000 feet.

When he alighted he told me he could have gone a lot higher, but had promised Mr. Sopwith not to go above 6,000 ft., so as to be down while the light was good. He said that it was quite warm while up high, but in coming down after reaching the 1,000-foot level it was like diving into a cold lake.

I think that even those of the crowd who were stupid enough not to realise the strength of the wind, were impressed by the height Mr. Hamel reached, and the majority of them, as they went out, seemed to agree that they had had value for their money.

One of the first to greet Mr. Hamel on his return was Miss Trehawke Davies, who flew the Channel with him last week, and she was very anxious to get him to take her up as a passenger on Mr. Sopwith's machine, but as the wind was getting rather worse than better, he wisely decided that he had done enough for the day.

It was cruel luck having such a gale on such a fine day, for if the first day had been calm there would have been great flying, and most of the people would have come on other days and have brought friends, whereas if it had been wet and windy people would have stayed away and have come on another day instead, when they might have seen more flying and have been more impressed still, for most people prefer quantity to quality.

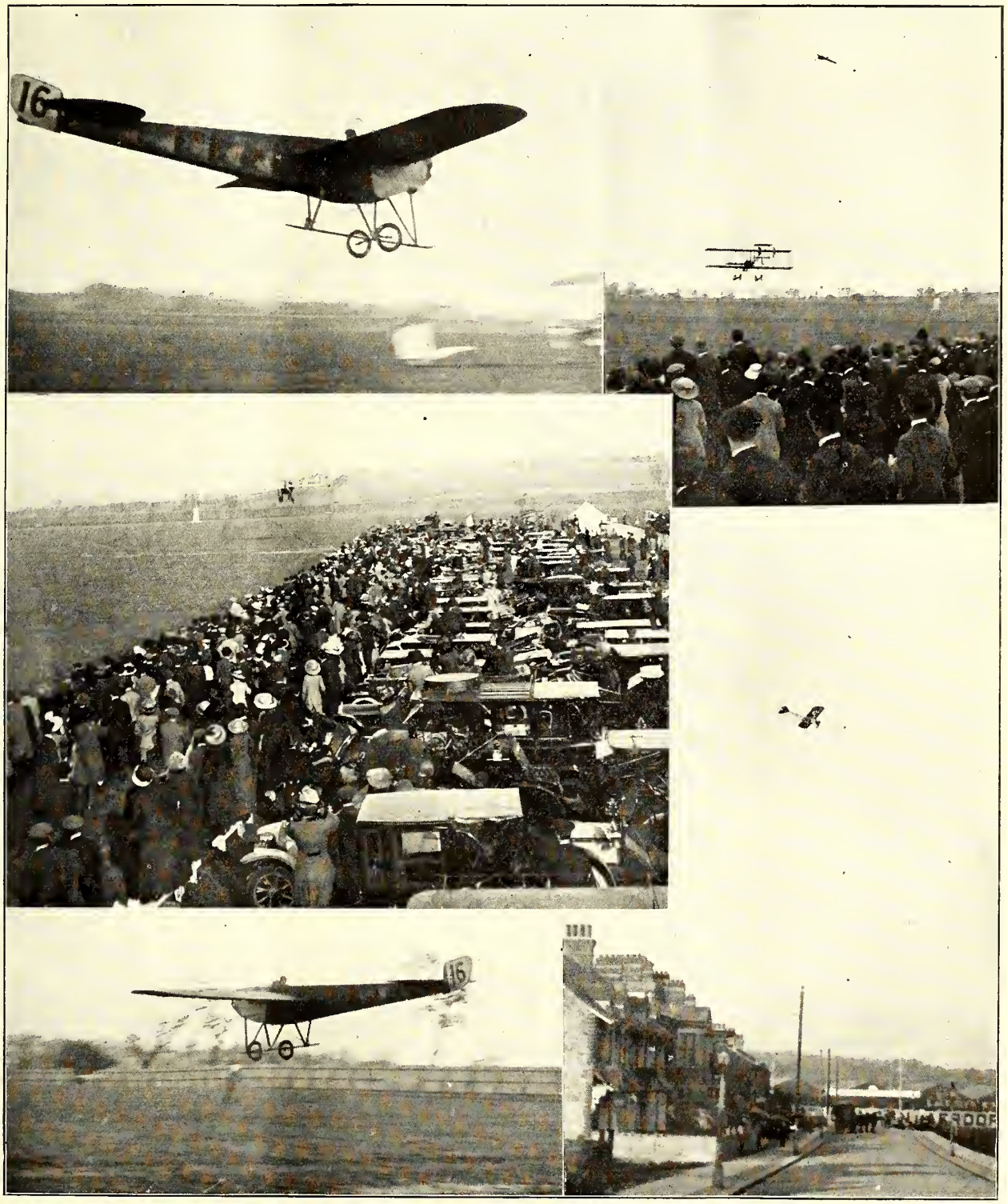
During the afternoon several telephone messages were received from Mr. Cody at Laffan's Plain, saying that he would start as soon as the wind went down a little. But as it got rather worse he did not arrive.

Saturday's Exhibitions.

Saturday's weather was a repetition of Friday's, only more so. The gusts at times ran up to 40 m.p.h. on the anemometer, and hardly ever dropped below 15, so it was fair to estimate that at its worst the wind was doing all of 50 m.p.h close to the ground, and more higher up. Nevertheless, Mr. Grahame-White, true to his intention to give the crowd a show, took out the old Farman and did wonderful things with it. At times when facing the wind he demonstrated the possibility of soaring flight by standing stock still in the air, and at others did jumps of 20 ft. up and down without making appreciable headway. When he turned with the wind the machine simply tore along, and once, as he shot past the judge's box, Mr. W. G. Aston, who was standing by me, ejaculated, "Who says a Farman can't do ninety miles an hour?" And doing ninety she was, or something very like it.

During the afternoon Mr. Grahame-White made three of these daring flights, and I only hope the crowd appreciated the fact that they were watching about the finest display of airmanship—in its proper sense—that has been given on any aerodrome. A certain Francophile member of the crowd to whom I was talking tried to persuade me that on a French aerodrome there would have been a dozen or more machines out in as strong a wind, but he apparently forgot that the dead steady wind one gets on a French plain is rather a different thing from the choppy, cut-up gusts from which we suffer in this country. Incidentally it is worth noting that when Mr. Hamel and Miss Trehawke Davies arrived at Issy-les-Moulineaux last week they found every shed shut and everyone afraid to venture out on account of the wind, and yet

PICTURES OF THE FIRST LONDON AVIATION MEETING.



Top Left:—Mr. Grahame-White starting a turn on the 70-h.p. Nieuport. Top Right:—Mr. Grahame-White landing on the late lamented Farman, and Mr. Hamel banking on the Blériot above. Centre:—A corner of the half-crown enclosure, showing a few of the cars present on Saturday. Mr. Hamel on his Blériot is just landing. Bottom Left:—Mr. Grahame-White on the Nieuport cornering. His head can just be seen over the body. Bottom Right:—Mr. Sopwith doing a fine spiral glide on his 70-h.p. Blériot, taken while approaching the gates of the London Aerodrome.

Hamel assured me on Saturday that he did not get half such a bucketing over Paris and when doing spirals to land at Issy as he had been getting on Friday and Saturday at Hendon.

Mr. Lewis Turner also made a flight of some circuits on the same machine, and enhanced his reputation considerably thereby, for it was no day for anyone but a first-class flier to be out.

In between Mr. Grahame-White's flights, Mr. Hamel did two very fine exhibitions on his Blériot, the machine, as usual, being blown almost to a standstill when facing the wind, and coming back at something over 100 miles an hour. Both flights were beautifully done, but the finish of each was distinctly exciting. The first time he did a sharp, steeply banked dive round the end of the sheds and looked as if he were going to drop onto the crowd, but he had allowed exactly for side-drift and centrifugal force, and landed with a slight bump from a gust about 20 yards out from the rails.

The second time he went up to about 2,000 ft., and came down before the wind at a terrific pace. Just as he got over the half-crown enclosure he did a terrific spiral dive, so that standing on the ground one had almost a complete plan view of the machine. Just as it looked as if he must land on the top of the sheds, he switched on and went out over the back fence, where he got two kicks from curly gusts in quick succession that nearly planted him in the field at the back, but he saved himself cleverly and came round into the ground, making a perfect landing amid real enthusiasm.

All the same, I wish he would not play monkey tricks in a gusty wind. The best of machines have their limits, and a gust at the wrong moment is always likely to find the limit. After M. Blériot's announcement about broken wings a week or so ago, aviators ought to go rather easier with their machines, and Mr. Hamel is far too good a flier to be wasted in amusing a crowd. Mr. T. O. M. Sopwith, who is every bit as fine a flier, but who has had the advantage of wider experience, remarked during the afternoon that he had seen all the American fliers who played tricks to amuse the crowd picked off one by one, and we ought not to encourage similar practices in this country. With these sentiments, I need hardly say, everyone who has the best interests of aviation at heart will cordially agree. Although personally I have a great liking for Gustav Hamel, it is no concern of mine whether he smashes himself up or not, but I strongly object to his doing so while playing tricks with an aeroplane, for he is about our most popular aviator, and his death, or even a serious accident to him, would have a most damaging effect on aviation generally.

After tea, Mr. Grahame-White had his 70-h.p. Nieuport brought out and made his first public appearance on it in this country. It was a most impressive performance. The speed with which the great powerful machine bored its way into the gale that was blowing, at the same time climbing rapidly, showed the crowd something quite new and unexpected. When he turned somewhere over Edgware way and came back at a speed in the region of 120 m.p.h. with the wind behind, the crowd fairly gasped. Then he made a couple of circuits of the aerodrome, and as he swept past the crowd along the marked course his speed, owing to his closeness to the ground, seemed even greater than before.

He played no tricks; it was just plain, honest flying of the very best sort, but somehow the terrific speed, the steadiness and the peculiarly vicious aspect peculiar to the Nieuport, gave one the impression that here was a real war machine, a machine to be reckoned with in case of trouble, and something we ought to have in quantities in this country, and have not.

Mr. Grahame-White's landing was, of course, perfection, and he was loudly cheered as he pulled up near the winning-post. Then he went and got out his Farman—presumably by way of contrast—and did a few more wavy circuits. After the streamlined, symmetrical, beautifully balanced, and carefully-designed monoplane. the poor old biplane looked as if it had simply occurred instead of being intentional, and it appeared as archaic as an Elizabethan galleon would do beside a modern destroyer.

Afterwards, Mr. Hamel did another short flight, with some pretty turns, none of them as risky as during his previous flight, and so the crowd departed, having certainly had more than value for their money, if they had the sense to know it. And then a well-known journalist connected with an aeronautical paper, which shall in mercy be nameless, came up to me and said, "You know, they'll never get these people to come here again, after such a poor show as this." Heaven help aviation if the people, who are more or less on the inside of things, are such poor judges—either of crowds or of flying; it was not worth while bothering about which he misjudged. As a matter of fact, it was one of the finest days' exhibitions of flying one could hope to see, and the bulk of the crowd were very well pleased. Several strangers to whom I spoke at Hendon said they did not expect to see any flying at all in such weather, and had only come up on the off-chance. Others expressed their delight at what they had seen, and the hundreds who hung on till long after the three bombs announced the finish of flying, showed there was genuine enthusiasm. Of course, there were grumblers, but some people will grumble when they get to Heaven because they think their halos do not fit, and a few were doubtless genuinely disappointed because they did not have the pleasure of seeing anyone killed.

In the intervals between flights considerable amusement was caused by excellent displays of Pain's daylight fireworks. The bombs which on exploding discharged weird animals, fat ladies, and other quaint shapes, served a double purpose, for they not only interested the crowd, but they showed the more intelligent what a shocking wind was blowing.

Altogether it was a very good day's sport, considering the weather, and the public should be grateful to Mr. Grahame-White, Mr. Hamel, and Mr. Lewis Turner for providing it.

During the afternoon Mrs. de Beauvoir Stocks had the Farman brought out, intending, at any rate, to do some straight flights, but Mr. Gates and the stewards of the meeting very wisely persuaded the plucky little lady from making the attempt, for it was no weather for a woman to fly in, even one of Mrs. Stocks' undoubted ability.

The only pity was that none of the British-built machines were there to make a show. Several of the Bristol pilots are of sufficient quality to have made a good display on one of the new military monoplanes, and Mr. Moorhouse would certainly have flown his Radley and Moorhouse monoplane if he had had it there. As it is, some 40,000 people, many of them official people of considerable influence, have gone away with the notion that only Farmans, Blériots, and Nieuports can fly in a wind, and small blame to them if they see nothing else.

C. G. G.

At Hendon on Sunday.

The weather on Sunday was by far the most favourable since the commencement of the Aviation Meeting. People began to arrive at the aerodrome from about 10.30 a.m., and before 1 p.m. quite a goodly crowd had collected, while after luncheon motor cars and more visitors arrived in large numbers.

Early in the morning, about 5.30, M. Prenssiel had taken out his Anzani-Blériot, but his trial flight came to an unfortunate and abrupt end. Whilst flying low round the aerodrome his chassis sat on a pylon with such force that he capsized the pylon, but of course the machine suffered far the worst damage, and will need some days in the repair shop before it can fly again. Luckily the pilot was unhurt.

At 11.50 a.m. an aeroplane was sighted from the south-west, which afterwards proved to be Mr. Sopwith's Burgess-Wright coming over from Brooklands piloted by Mr. Raynham, with Mr. Snowdon Hedley as passenger, the journey having taken 24 mins. for the 19 miles.

About 1 o'clock Mr. Grahame-White brought out his 70-h.p. Nieuport, which he took up in grand style. Flying six laps of the course, he covered a distance of 9 miles in 8 mins. 21 secs.

The wind was now blowing from 0-10 m.p.h., and between 1.30 and 2.30 Mr. Sopwith took up several passengers in his Wright machine and also in his 70-h.p. Blériot. Mr. Lewis Turner was also up with passengers on a Farman biplane.

At 3 o'clock Mr. Hucks made his first trial flight on a 50-h.p. Blériot, reaching a height of 2,600 ft., a very fine performance for a first attempt. Shortly afterwards Mr. Allen ascended, also on a Blériot. Then Mr. Ewen, who had made two flights of 20 mins. each in the morning, made another flight on his 28-h.p. Anzani-Deperdussin, and went out of the aerodrome to Harrow and back, having a rough journey and finding the wind, which had now freshened considerably, somewhat too strong.

Ten minutes later saw Mr. Hamel in the air, which brought shouts of applause from the crowd.

Soon after this Mrs. de Beauvoir Stocks flew a few circuits on a Farman, her clever performance being greatly appreciated. After landing she stated that she had found the wind rather tricky to fight against.

The prettiest sight of the day happened about 3.40, when six machines were in the air together. Messrs. Hamel, Allen, and Hucks, on 50-h.p. Blériots, Sopwith on his 70-h.p. Blériot, Grahame-White on his 70-h.p. Nieuport, and Lewis Turner with a passenger on Mrs. Stocks' Farman biplane circled the aerodrome at varying speeds and heights, to the huge delight of the crowd.

Messrs. Grahame-White, Hamel, and Sopwith continued

giving exhibition and passenger flights, and shortly before five o'clock Mr. Raynham, with Mr. Young as passenger, started to fly back to Brooklands Sopwith's Wright. We heard by telephone that they arrived safely at 5.30.

Between 5 and 5.15 I had the pleasure of having a flight with Mr. Sopwith on his 70-h.p. Blériot. We covered four circuits of the aerodrome, and in that distance reached a height of 550 ft., from which we did a *vol plané* and landed just in front of his shed.

At 6 o'clock the crowd began to disperse, but shortly afterwards Mr. Hamel made a very fine flight. He was up about a quarter of an hour, reaching a height of over 3,000 ft., and descending with a spiral *vol plané,* turning right and left alternately, and on his descent he was loudly cheered by the remaining spectators.

For a Sunday the crowd was very good, and although not as large as on Friday and Saturday, it was highly satisfactory both in numbers and enthusiasm. Among the visitors was the Lord Mayor of London, who showed great interest in the machines and flights. Before leaving the aerodrome he informed Mr. Grahame-White that he would be pleased to offer some prize as an encouragement to British aviation, and it is to be hoped that his example will be largely followed by other influential people. The Stage was well represented by Mr. Robert Loraine, Mr. Gerald du Maurier, Mr. Marsh Allen, Miss Ellaline Terriss, Mr. Seymour Hicks, and Mr. Cyril Maude. The two last-named were so pleased with the flying that they kindly offered to present cups to be flown for during the season.—R. DelaCombe.

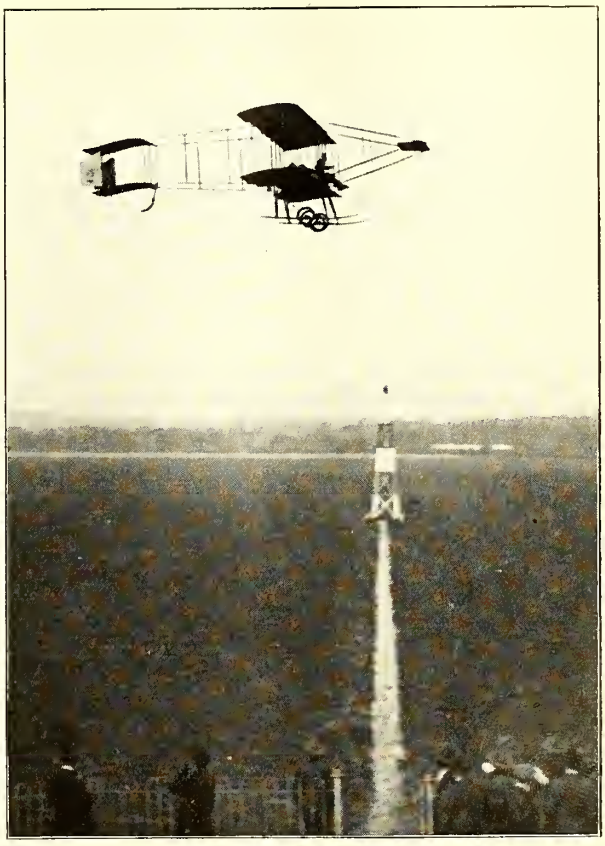
Easter Monday.

The worst of luck befel the meeting on Easter Monday, for the wind, which had been steadily getting up all through the night, started to blow a gale as the morning wore on, and by mid-afternoon was blowing pretty nearly what Sir Hiram Maxim, quoting Mark Twain, classes as a "Washoe Zephyr." Even the anemometer consented to show 45 m.p.h., so one could reckon safely on 65 m.p.h. as the real speed.

Nevertheless, Mr. Grahame-White, true to his promise of Saturday, to fly "wind or no wind," had the poor old "Birmingham" Farman brought out, and, with two men sitting on the front edge of the plane and two more standing on the skids, rolled her across the ground. Then he turned, and with Mr. Lewis Turner and his faithful mechanic Carr sitting on the plane to keep the machine from lifting too high, made an alarming straight flight against the wind, landing near the railings, after an appalling dip which looked for a moment as if he was going to land on his front elevator. I think the crowd realised the danger of the performance, for they really cheered as if they meant it.

Thereafter followed another wait, and then Mr. Grahame-White determined to make another of his daring attempts to keep faith with the public. He did it, but only at the imminent risk of his life, which is at present too valuable to be wasted in placating a mob.

Once more with Mr. Lewis Turner and Carr as "make-weights" he started to run on the ground across the aerodrome with the wind behind, the wind being so strong that the ailerons were blown down, instead of floating out behind the planes. At the railway embankment he turned round with difficulty, and tried to fly back. Hardly had he got into the air than a gust struck the machine and the left wing went up. Mr. Grahame-White made a fine attempt to right her, but apparently the ailerons on the right acted as a drag, and the machine slewed round, exposing the whole underside of the left wing to the wind. At the same time the right wing-tip touched the ground, and the outer *cellule* broke away, so that the whole machine turned a cart-wheel, at the same time turning upside down. It was fortunate it did turn completely over, for if it had simply cart-wheeled and come down on the leading edge the chances are that all three of the crew would have been trapped by the front spar—as is the custom with box-kites. As it was they were all neatly decanted either on to the ground or on to the upper plane as it lay underneath the machine. When I got across to the wreck I found the crew collecting themselves and looking for wounds, but beyond a scratched wrist for Carr they were all unhurt. Then a cinematograph man arrived, and the three heroes—or victims, which you will—were incited to climb on to the top of the machine to be cinematographed. Soon after Mr. and Mrs. Leonard Williamson, on their big 90-h.p. Berliet, arrived to bring home the wounded, but, when it came to getting back against the wind the car's wheels simply spun round on the grass and refused to grip, so the wounded turned out and pushed the car home, assisted by an assortment of large policemen, small boy scouts, and medium-sized legionaries of frontiersmen.



Mr. Grahame-White doing "nineties" on the deceased Farman.

Altogether it was one of the merriest returns from a smash that I have ever seen, and no one, least of all its owner, seemed to feel a bit sorry for the poor old "Birmingham" lying pathetically on her back, and kicking her skids in the air, while she wept mingled petrol and castor oil all over the upper plane, which was underneath.

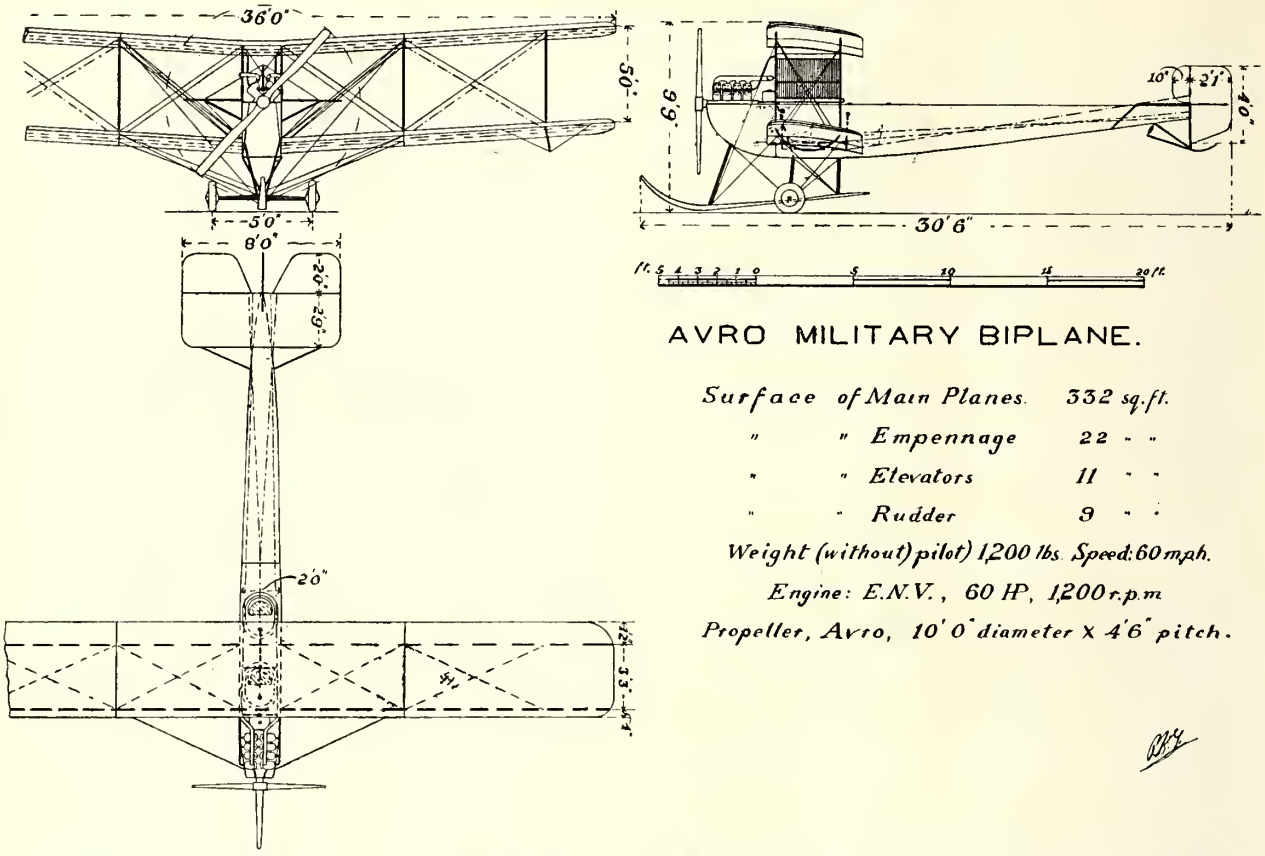
After this Mr. Grahame-White paraded an Anzani-Blériot, and later his pet Nieuport, along the rails for the crowd to inspect, and at 5 p.m. the crowd were allowed on to the ground to investigate the remains of the Farman at close quarters, which privilege seemed to be appreciated, for many hundreds of people tramped across the aerodrome to see it, and incidentally found on their way back what a 60 m.p.h. wind is like on an open plain.

And so ended London's First Aviation Meeting—a meeting thoroughly well planned, excellently managed, and only prevented by hopeless weather from spreading really great enthusiasm among hundreds of thousands of Londoners. Even as it was many thousands must have had their eyes opened as to the possibilities of the modern aeroplane by the fine displays of the Blériot and Nieuport, and it is to be hoped that the future meetings which are being planned will be blessed with weather which will give Mr. Grahame-White and his clever lieutenant Mr. Gates a chance of doing to the best advantage the good work they have taken in hand of popularising aviation in this country.

The future programme of the Grahame-White Aviation Company includes the holding of meetings and organised exhibition flights every week-end, the erection and equipment of a really comfortable club-house with a moderate subscription, and the foundation of a genuine flying club in which the members can do as much flying as they like on well-built, up-to-date aeroplanes at a price which will be well within the means of any man who can afford to hunt.

Also, an Aerial Derby is to be organised for the summer, in which the competitors will start from Hendon, fly all round the outskirts of London, and finish at Hendon again. An excellent idea, and one which deserves to be highly successful, for it will have the effect of giving all London a chance of seeing what aeroplanes can do.—C. G. G.

The Avro Military Biplane.



AVRO MILITARY BIPLANE.

Surface of Main Planes.	*332 sq.ft.*
" " *Empennage*	*22* " "
" " *Elevators*	*11* " "
" " *Rudder*	*9* " "

Weight (without) pilot) 1,200 lbs. Speed: 60 m.p.h.

Engine: E.N.V., 60 H.P., 1,200 r.p.m.

Propeller, Avro, 10' 0" diameter x 4'6" pitch.

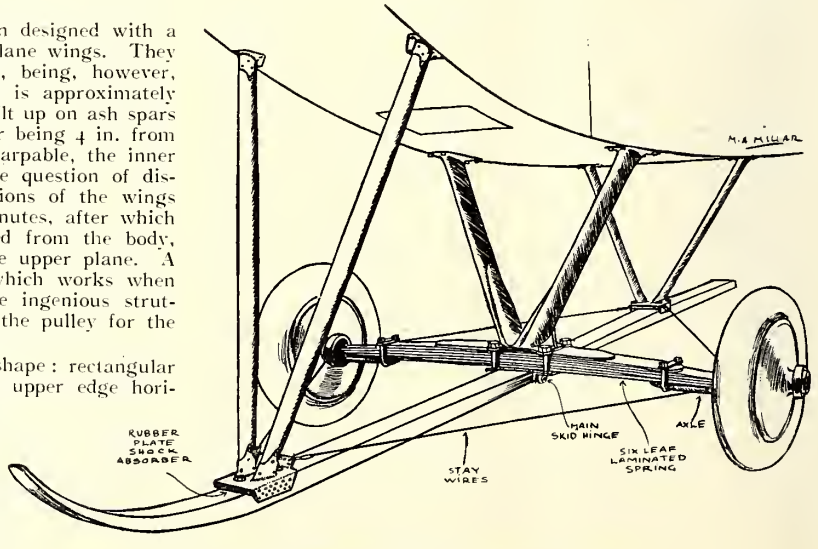
The second of the new type Avro biplanes, which was designed for use by Lieut. Parke, R.N., in the Mortimer Singer Prize Competition, is one of the nicest examples of design in this country; and as such it is certainly one of the best biplanes in the world. One cannot praise it more highly than by bracketing it with the Cody, the Royal Aircraft Factory machines, and the new Bristol.

The machine is similar in type to the earlier Avro biplanes, but has been brought up to date by the adoption of an enclosed streamline fuselage and wings of a better camber, according to modern ideas.

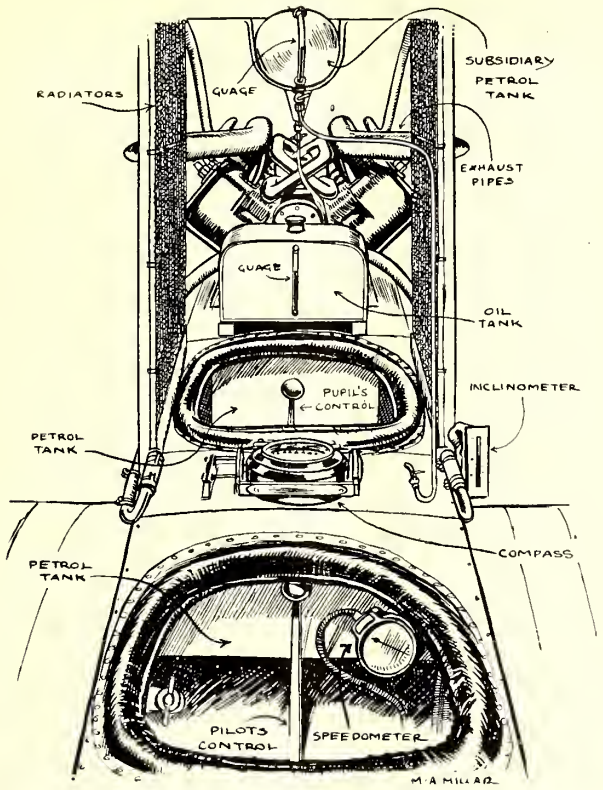
The planes are noteworthy in having been designed with a care which is usually devoted only to monoplane wings. They are approximately rectangular in plan-form, being, however, rounded at the corners. Their aspect ratio is approximately $7\frac{1}{2}$ to 1. They are double-surfaced, being built up on ash spars 2 in. by $\frac{3}{4}$ in. in cross section, the front spar being 4 in. from the leading edge. The outer sections are warpable, the inner being rigid. Attention has been paid to the question of dismounting. For this purpose the outer sections of the wings can be removed from the inner in a few minutes, after which the inner sections may be similarly removed from the body, leaving only the small central section of the upper plane. A sketch shows the hinge in the rear spar, which works when the warp is used, while another shows the ingenious strut-socket (of pressed steel) which incorporates the pulley for the warp wire.

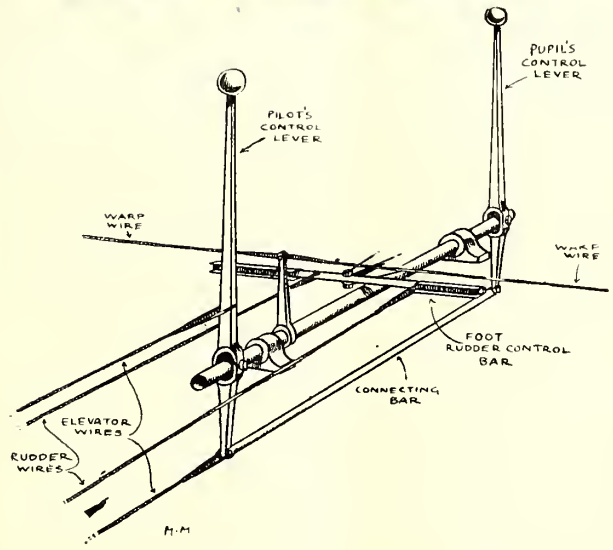
The fuselage is more or less of Nieuport shape: rectangular in cross-section, full-bodied, and having the upper edge horizontal in flight. The "breast," and the sides from the propeller to the front wing-spar, are covered with aluminium sheet, the remainder being fabric-covered. The construction is of the usual wired-up box-girder type, considerably heavier than have been the fuselages of most of the Avro machines. The body tapers to a vertical line at the rear, to which is hinged the semi-balanced rudder, which is more or less rectangular in form, and is of considerable area. At the bottom of the rudder-post is pivoted the tail skid (as shown in sketch), two struts of steel tube taking the shock when in use. The empennage is rectangular, with the front corners rounded, and behind it are the twin elevator flaps, which are shaped to allow free movement for the rudder.

The chassis, shown in detail, is a modified Nieuport, and (as is by no means always the case) the modifications are real improvements. The main support consists of the middle pair of

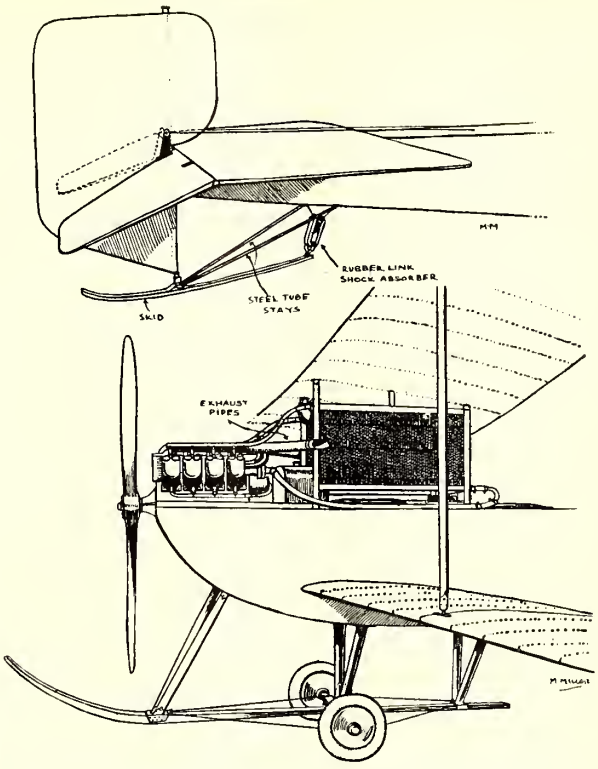


Chassis details of the latest Avros.

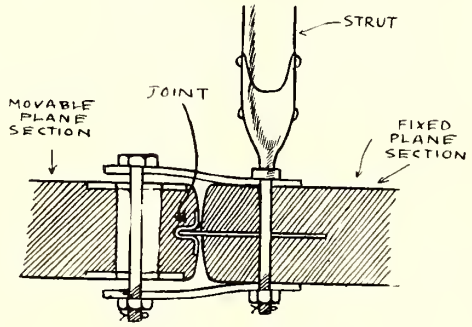




Details of the seating arrangement and dual control.



Control planes and tail skid, and power plant arrangement.



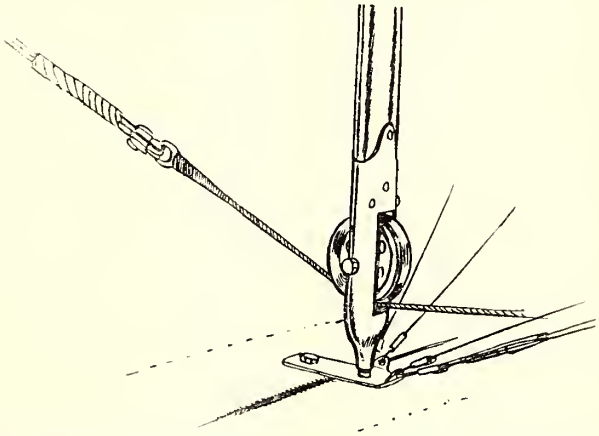


Diagram of the warping joint in the rear spar, and the combined strut-junction, and warping pulley on the fixed cellule.

steel tube struts, which join at the centre of a plate-spring axle to which are attached the axles of the two disc wheels. The skid, however, instead of being one piece of steel tube, is in this case composed of two separate wooden members, separately hinged below the junction of the main struts and the wheel axle. Forward and aft of the main struts are two other pairs; the front pair are of wood, and are quite light, being designed to crumple first (it is admitted that the wisdom of this is a point yet to be decided); the rear pair are of steel tube. The joint between skid and struts is most ingenious: the two struts are fixed into steel sockets welded to a large channel plate, the webs of which project down by the sides of the skid, and prevent lateral play. Bolted inside this plate is a solid pad of rubber, about 1 in. thick, the bolts bearing on large washers under the pad. The rubber is also attached, by similar bolts, to the skid. There is thus no rigid connection between the two, and they are yet very firmly joined. The

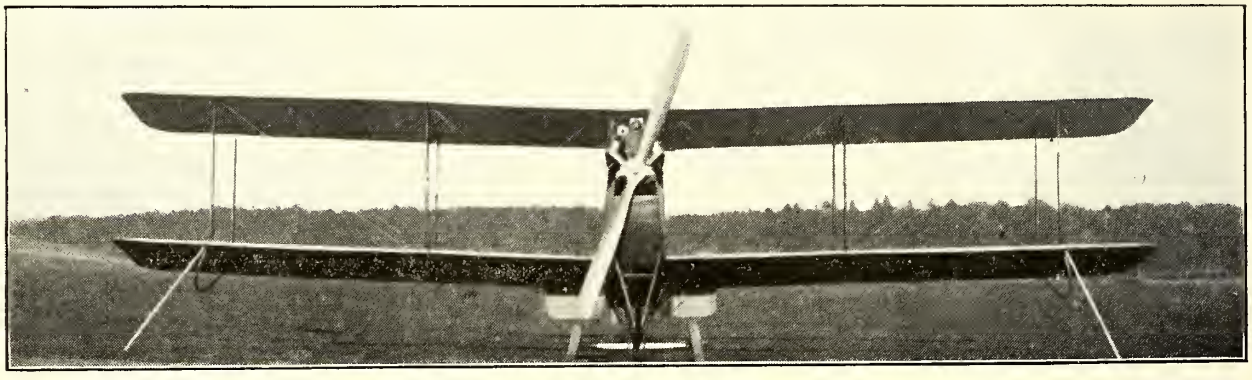
various stay-wires are attached to the channel plates, so that they put no strain on the elastic joint.

Another sketch shows the power plant, which is, on the whole, fairly well arranged. In view of the careful streamlining on the rest of the machine, it seems rather a pity that the engine and all its accessories are so fully exposed; for this machine certainly offers an unusual opportunity for the use of an enclosed motor and geared-down propeller. Apart from this, the power plant is right enough. The 60-h.p. E.N.V. engine is carried on extra bearers resting along the top of the fuselage, the oil tank being immediately behind it. The "spiral tube" radiators are placed above and on each side of the fuselage, between the plane-struts, and between them is a gravity-feed petrol tank, which will hold enough for one hour. For longer flights there are two large interconnected tanks, which are located inside the fuselage, in front of the pilot and the passenger. Petrol is pressure-fed at intervals from these to the upper tank. The exhaust is led off by two pipes which open outside the radiators on each side, the pilot and passenger being free from any annoyance from them.

The general arrangements of the pilot's and passenger's cockpits are well shown by Mr. Millar. The seats are placed deep in the fuselage, so that only one's head is exposed; and owing to the warmth from the radiators and the position of the oil-tank, there is hardly any draught and no cold. The edges of the cockpits are carefully padded, in view of possible accidents, though, as I was informed when about to try a passenger flight with Mr. Parke, the passenger should wear a helmet to avoid the chance of "filleted face" from the radiator gills in the event of a smash. The space between and around the cockpits is covered with three-ply wood, to give a solid floor for climbing in and out. In comfortable view of the pilot are—an engine tachometer, an inclinometer, a compass, and an aneroid (the latter is inside the fuselage, directly beneath the compass, and is not shown). He also has a pressure pump, a switch, and throttle lever, the latter being in duplicate, for control by pupils if necessary.

The flying controls are remarkably neat. There is complete dual control by foot rudder bar and universal lever. The "dual personality" is well shown in Mr. Millar's drawing. The two levers are both pivoted on a steel tube, which runs under the passenger's seat. They project below it, and their ends are connected by a somewhat lighter tube. It will be seen that a fore and aft movement of either lever will leave the main tube unmoved, but will operate the elevator, whose wires are connected to the pilot's lever. A sideway movement of either lever rotates the tube, thus affecting the warp. The two rudder-bars are coupled by wires at their corresponding ends.

Altogether, as previously remarked, the machine is in many details an advance on most current practice. Unfortunately it was not tuned up in time for the Mortimer Singer competition, but one may be reasonably certain that, with Mr. Parke at the helm, the "Avro Military" will distinguish itself during the coming season.—P. K. T.



Front view of the Avro, showing absence of head resistance.

A New Attraction for Hendon.

The Hendon Aerodrome is promised a new attraction in the course of the next week or so, for Mr. W. H. Ewen is adding to his stock of school machines a couple of Caudron biplanes. It has been a continual source of wonder to the writer during the past two years why no one in this country has taken up the Caudron type of machine, for it is about the cheapest to build, repair, or buy, of any machine in the world, and yet it flies well and is a very safe little machine. Mr. Ewen was at Crotoy just before Easter and definitely fixed up the Caudron agency. When he and a friend arrived at the nearest station Mr. Ewen telephoned to Crotoy to the Caudron works to say he had arrived. He was told that M. Caudron was coming to meet him per aeroplane. As soon as he left the telephone office he saw the little biplane coming along, and as it passed overhead M. Caudron dropped a letter addressed to Mr. Ewen saying that a car was coming to fetch him. Soon after M. Duval, the clever Caudron pilot, arrived with the car, M. Caudron circling overhead till he saw his guests into the car, when he flew off to his works and was there to greet them on their arrival. It must be admitted that this was an unusually effective way of showing off the machine, and it is small wonder that the Caudron firm is doing well with such a man at its head.

A New British Aviatress.

A week or two ago a short account was given of some notable flying done by Mrs. Buller on a Bréguet at Douai. This plucky little lady has now won her certificate, having done so on April 2nd, and only at her seventh flight alone on the machine. Although she has been at the school for eight weeks the weather has been so bad and the other pupils have broken up so many machines that she has only had about a flight a week, her last, prior to taking her certificate, being on March 12th. Her performance is the more noteworthy in that she took her certificate without breaking anything, a feat which resulted in her having to treat the other pupils to a champagne dinner at the local hotel, though her bargain included the humorous proviso that if she broke anything while training the dinner was only to include *vin ordinaire*. Mrs. Buller hopes to bring a Bréguet to England ere long, and she will certainly be heartily welcome at any aerodrome to which she brings it.

The Gilmour Memorial Fund.

This fund is still increasing in a very satisfactory manner. A widespread interest in aviation is shown by the number of subscriptions from those who neither knew nor had seen Mr. Gilmour. Mrs. Handasyde, who has collected a large proportion of the fund, has this week forwarded a sum of £5 8s. 3d.

	£	s.	d.
Amount already acknowledged	121	10	9
T. Hetherington	3	3	0
The Earl Poulett; Mrs. Speke—£1 1s. each (2) ...	2	2	0
Louis Coatalen; T. P. S. and A. R.—£1 each (2)	2	0	0
Major F. Lindsay-Lloyd; E. Hotchkiss; B. H. Barrington-Kennett—10s. each (3)	1	10	0
T. W. Mackworth; J. Duff-Gordon; W. M. M.; J. Cameron; Havilland Hoskeyns—5s. each (5)	1	5	0
M. Campbell; M. M.; C. A. Allen; G. E. Morrison; R. H. Berkeley; G. G. Mead; A. F. Hudson; R. E. Southworth; R. Lisle—2s. 6d. each (9)	1	2	6
A. J. C.	0	2	0
R. Somers Lewis	0	1	6
G. Bullen; G. Dowling; W. N. Stone; C. G. Tyrol; G. Baker; G. B. P.; C. Rowan; G. Lewis; R. H. Rose; A. H. L.; H. Hulbert; L. D. Sewell—1s. each (12)	0	12	0
H. J. W.	0	0	3
Total	£133	9	0

Correspondence.

The Editor of The Aeroplane *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* The Aeroplane, 166, *Piccadilly, W.*

Downward Pressure on Wings.

Sir,—After discussing this matter recently I was in doubt as to the truth of a statement that the centrifugal force of a machine made to dive suddenly could not break its wings downwards. So for curiosity I worked it out for myself, as best I could.

Taking the machine to be of the Blériot type, its weight complete is about 900 lbs., its speed 90 ft. per sec. (62 m.p.h.), and the distance between the elevator and the centre of gravity about 15 ft. If we suppose that the pilot, by pushing the *cloche* hard forward, puts 5 lbs. per sq. ft. lift on the elevator, the total centrifugal force is only 250 lbs. or so. Even at 7 lbs. per sq. ft. it is only about 400 lbs. Most wings certainly should be able to withstand this pressure, so apparently some other factor must play a part in the downward pressure.

It struck me then that possibly an upward *remou* might add to the pressure. Suppose an aviator ran into an upward current of air having a speed of 20ft. per sec. (it seems fast, but I don't think beyond the bounds of possibility), the resultant speed of the machine will be 92 ft. per sec., and the flight path would be at an angle of about 13 degrees to the horizontal. When the machine runs out of the *remou* it hits still air at an angle of 13 degrees, though the planes will only do so at an angle of about 5 degrees, 8 degrees being taken off for their angle of incidence.

Now supposing the aviator, on finding himself rising at this rate, dips to the extent of 25 degrees—a thing not unlikely should he be wanting to descend quickly or feel nervous. When he reaches the still air the negative angle of the planes will be as much as 30 degrees. The pressure on a plane at an angle of 30 degrees is .64 of that on a normal plane, that is to say, .64 of 11 lbs. per sq. ft. (at 92 ft. per sec.). This works out at 7 lbs. per sq. ft., and as the Blériot surface is 250 square feet, the total pressure on the wings is 1,750 lbs. To this may be added the centrifugal force of 250 lbs. There are not many monoplane wings built at the present moment capable of withstanding a downward pressure of 2,000 lbs, and this may, if my calculations are right, account for some of the downward breakages of wings. At any rate, it appears that there should be some modifications to the old rule of "Dip when anything happens," as it obviously increases the danger in the above case.

There is another point to be taken into consideration in the case of downward pressure. If the tops stays are not braced quite tight, that is to say, if the planes have any up and down play, then the drift of the wings will be solely taken up by the wing spars themselves, as there are no wires on the top of the planes running forward to take the drift.

Royal Aero Club. Denys Chataway.

Sir,—I have been greatly interested in the theories that have been put forward as to the cause of the various inexplicable accidents that have recently occurred to monoplanes, and especially that to Mr. Graham Gilmour's machine on February 17th. I see that in the last week's issue of The Aeroplane you publish a possible explanation given by M. Blériot of the causes of the fatal accidents to Chavez, Blanchard, etc. Might not the same explanation also apply to Mr. Gilmour's accident?

M. Blériot's idea is that, if a monoplane commences a sudden steep dive, the horizontal momentum of the machine causes a *downward* load on the wings, and, when this becomes too great, the wings collapse *downwards*.

My own theory of Mr. Gilmour's accident is that his engine stopped suddenly during flight, and he had to land at the nearest convenient spot. This happened to be in the Old Deer Park at Richmond. The landing-place being restricted and immediately below him, he had to perform an unusually steep *vol plané*, with the result that the pressure upon the upper surface of the wings became so great that they collapsed in a downward direction. Eye-witnesses confirm this when they state that the wings appeared to fold *backwards—i.e.*, towards the fuselage—because they would have the appearance of doing this when viewed from certain positions on the ground. I have seen it stated that, on examination of the wreckage of the machine, all the *under* stay wires of the wings were intact, but no mention is made of the *upper* ones.

It would be interesting to know if these were broken or strained in any way. Also, it is stated that the bolts which held the near wing spars in position were bent outwards, but not broken. The mere fact of the wings folding downwards would cause this.

Besides the pressure on the upper surface of the wings, there would probably be a partial vacuum formed on the under side, which would tend still further to put too great a strain on the upper stay wires.

This explanation would possibly also apply to Hubert Oxley's accident at Filey, and to that of Captain de Winckels on Salisbury Plain. The downward pressure on the wings would make it practically impossible to "flatten out" on landing, and so the machine would hit the ground nose first, with disastrous results.

Hildenborough. Reg. A. Cooksey.

Mr. D. Graham Gilmour's Death.

Sir,—An explanation is probably due to Messrs. Martin and Handasyde, and also to Mr. Trott, concerning my letter in The Aeroplane of March 28th.

No reflection is cast upon either of the gentlemen, and my theory of the causes was entirely wrong. My letter was written before the enquiry was held, and it was proved at the inquest that the Martin-Handasyde machine was the strongest ever built. As Mr. Grey suggested, I did mistake the coating on the wing for partly dried glue, and I tacked my suspicion on the fact that the wings were newly fitted.

Richmond. Jeremiah Jenkin.

Nomenclature.

Sir,—Your correspondent has raised rather an interesting point under this heading. Do you not think, however, that it is better to keep on with the present system of calling each new machine, or distinctive feature, after the name of its originator? For instance, when one mentions a machine of the Goupy type, you know the planes are staggered. Farman type signifies the biplane with the forward elevator and a lifting tail; Avro type, the biplane with the tubular body and the engine in front; Nieuport, the deep body with flat sides; Bréguet, the biplane with only the forward struts between the main planes. It would be a thousand pities if the names of the pioneers who introduce various features are allowed to be dropped.

The most suitable name for hydro-aeroplanes is undoubtedly hydroplane; but, as this already has a meaning, we must find another, and I don't think aquaplane can be beaten. P. K. T. is rather out of order in first objecting to aquaplane because it suggests a type of boat, and then recommends marine plane, which obviously would be more unsuitable, as it would therefore imply a boat for the sea. No, sir. Aquaplane is easy to remember and easy to say, and it will therefore stick.

Sans Culotte.

Naval Aviation.

Sir,—I wonder it has not struck someone that in partially neglecting aviation in the Naval Service a much graver fault is being committed than would appear at first.

It has always been recognised that to the individual safety of England, neglecting the protection of colonies, the Navy has always been of first importance, and would it not be correct to assume that in placing air scouts in mother-ships in the fleets, a powerful protection of our position as an island would be obtained?

True enough that aeroplanes in the hands of the Army would be invaluable—abroad; but would not this value be greatest to a nation like France, with a frontier very different from ours? Our frontier is the enemy's shore, or at least the sea; and surely it is there that the powerful new arm should be exercised.

Should any Power wish to send her machines into our country, surely prevention is very much better than cure, and the Navy is the prevention of what the Army may have to cure in the event of the Navy's failure.

I consider only the case of invasion. There are other uses for a Navy and Army, of course; but the aeroplane does not seem to lend itself to them sufficiently well to warrant serious considerations yet.

To consider smaller matters, it does not seem impossible for a machine to land on a mother-ship—which doubtless would have a broad beam and a clear flat deck, and would be driven by Diesel engines—in a pretty good seaway.

Gibraltar. W.

Sir,—In your last number your Avro-Brooklands correspondent states that their machine is only beaten by a few fast monoplanes. I have seen it fly, and I think I can say that the Cody, the Jezzi, and the Bréguet biplanes are all faster, though not very much. I think the Avro does about 65, the Jezzi 67, the Cody 69, and I believe the Bréguet has done 72-75. I may be wrong in the last statement. I think in all fairness to Mr. Jezzi and Mr. Cody you ought to make some note on this.

Ebbesbourne. C. N. Arnold.

[The Brooklands correspondent should, of course, have specified power for power and weight for weight. The Bréguet had 100 h.p., and the Cody 120 h.p. Mr. Jezzi has less power than the Avro, but also less weight.—Ed.]

"That's the Way the Money Goes."

Sir,—One of your contemporaries says, "The recent War Office tests of motor bicycles at Brooklands have resulted in the order of two motor bicycles from Messrs. Rudgeworth, Ltd., of Coventry." So that is why the Aviation Vote is so small, is it?

Brooklands. E. Rouse.

The Gordon-Bennett.

Sir,—I see it stated in the papers that Mr. Grahame-White and Mr. Gustav Hamel have been selected by the Royal Aero Club (by which I presume is meant the Committee) to represent England in the competition for the Gordon-Bennett Cup this year.

Now, while in no way decrying the admirable choice of the Aero Club Committee, why should we not have eliminatory trials over here as in France and despatch three representatives? There are many budding pilots who would be glad of a chance of competing.

Fair Play.

Aerodrome Flying.

Sir,—I think that anyone in the hangar enclosure at Hendon on Saturday last will regret that Mr. Hamel spoilt his fine flight early in the afternoon by the finely-judged, but extremely dangerous, dive into the aerodrome. I was quite near at the time, and I believe that the distance between the tail-skid and the railing was not more than 4 ft. or 5 ft. at the most.

There was once a rule that no aviator should return to the aerodrome at a height of less than 500 ft., and it seems that cleaning one's landing wheels on ladies' hats may prove an unpopular pastime!

St. Albans. Eric Hayman.

From New Zealand.

Sir,—I am instructed by my committee to inform you that the Dunedin Aero Club, 603, Cargill Road, Caversham, Dunedin, New Zealand, has been successfully launched with a membership of 22.

We propose holding a model show some time in September of this year, and if you could put us into communication with any firms or clubs who would be willing to send us exhibits, we would be extremely grateful.

We are willing to pay postage on any goods sent and to return same in good order unless sold.

Trusting you will be able to assist us in our struggle against prejudice.

B. Hughes, Hon. Sec., D.Ae.C.

[Will British firms please note?—Ed.]

The Choice of Fabric.

It is astonishing that only after three years of varied troubles have there been any signs of an intelligent interest in the question of fabric. In fact, for two years most pilots seem to have been quite satisfied with plain untreated cotton fabrics, which rotted in rain and refused to keep tight even in fine weather. The few who did not care for this covered their wings with rubber-treated material, which stretches with time and is ruined by petrol or oil.

During the last few months, however, a certain amount of wrongly-directed energy has been shown in trying to find a suitable varnish with which to "dope" wings already covered. Still no one seems (with the exception of M. Blériot) to have realised the main principle of fabric varnishing. It is only necessary to make one or two very simple experiments to realise the terrible effect which most varnishes have; for any hard-setting varnish, if allowed to sink into the fabric, produces a change such that the slightest puncture will instantly spread, the fabric ripping like paper.

It has, of course, been realised that a celluloid varnish is the perfect "dope," for it is impervious to air, water, oil, and petrol. But it has the disadvantage of often being hard when set. There are two ways of avoiding this difficulty. The first and more obvious is to apply the varnish over a resisting layer of size or other stopping. This, unfortunately, does not prevent the varnish from tending to crack if the fabric is bent or crumpled. The better method is to keep the varnish flexible. Hitherto, but few firms have been able to do this. The difficulties form one of the most technical sides of the gun-cotton industry, of which the manufacture of celluloid is a branch, and this is not the place to enter into them. It is sufficient to say that the customers of one firm in question, New Pegamoid, Ltd., have made repeat orders a habit during the past two years.

CLUB NOTICES.

Paddington and Districts Aero Club (1910).—Committee decided models used in club certificate trials, 1st and 2nd class, must be constructed throughout by the competitor. April 13th, Kite and Model Aeroplane Association trials, Parkside, 3 p.m. New members elected:—E. Evans (age 10), T. Officer, and R. Silent. Subscription 1s. per month.—W. E. Evans, Hon. Sec., 133, Buchanan Gardens, College Park, Harlesden.

Ealing and District Aero Club.—On Saturday, Messrs. L. Roche, A. Houlberg, G. Beeching, G. Pearson, C. Chilcott, H. Sanders, J. Pratt, and Margetson flying at Greenford. On Good Friday, L. Roche and J. Pratt flew. On Easter Monday a good many members went to Hendon to witness flying. Flying next Saturday at Greenford.—B. J. Kirchner, Hon. Sec., 1, Queen's Gardens, Ealing, W.

Stony Stratford and District Kite and Model Aeroplane Club.—All Members' Events are postponed till April 13th, but Open Event for junior non-members was held. Three entrants. Two finished. Members' meeting, Thursday, April 11th.—Oswald Hamilton, Junr., Hon. Sec., Old Stratford, Stony Stratford.

Bristol Model Flying.—"Duration" Competition held April 6th. Prize, pair of propellers, presented by Mr. R. M. Haines, won by Mr. Moore. Meeting, April 13th, 3 p.m., Sea Walls. Prize, pair of laminated propellers, for first model to rise from ground and fly 100 yards. Weight must exceed 6 oz.—R. V. Tivy, Hon. Sec., 3, Royal York Crescent, Clifton, Bristol.

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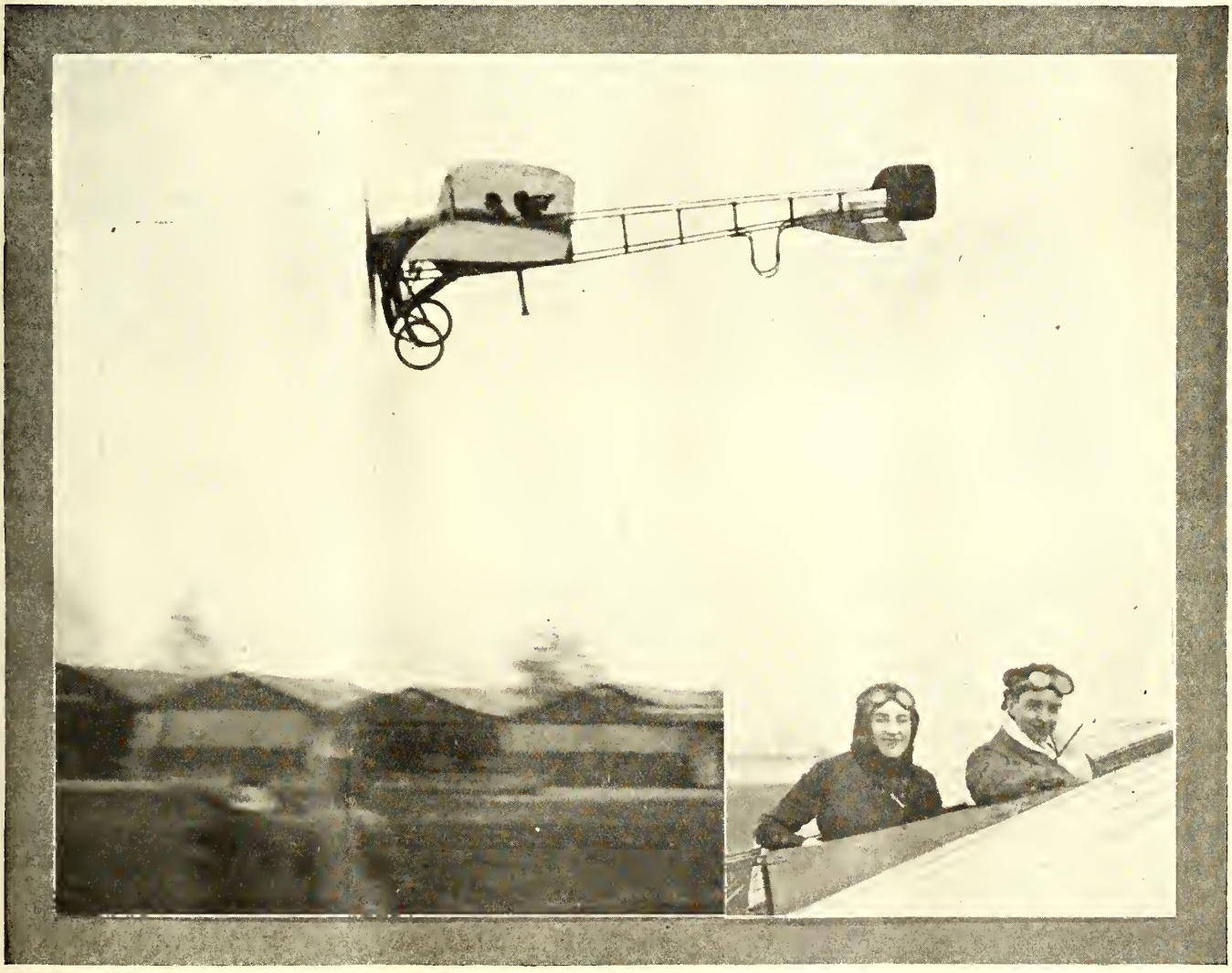
THE WINNERS.



Mr. T. O. M. Sopwith and Mrs. Lane on the Bleriot rounding the sheds at Brooklands at the end of the first lap in the cross-country handicap on Sunday last. Inset are the winners, taken just after the race.

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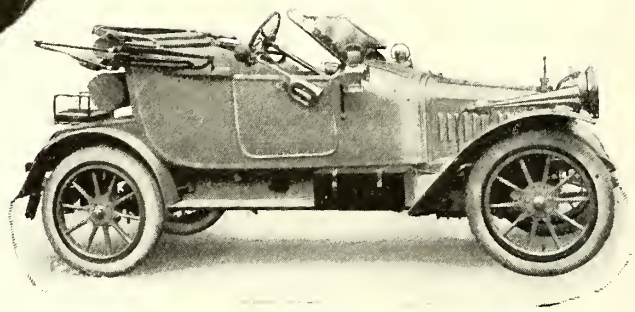

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MATTERS OF MOMENT.

THE OFFICIAL ANNOUNCEMENT ON AERIAL DEFENCE.

At last the long attended official announcement on Aerial Defence has been made and it is possible to size up to some extent the general prospects of aviation and the aeroplane industry for the present year. The official programme gives the British Empire about one-fifth of the aerial force it needs, and about twice as much as it deserves—considering the hopeless apathy of the people of this country as a whole where aviation is concerned.

Taking the scheme all round it is excellent, both in its definite details and in its expressed intentions, not the least satisfactory part of it being that it is honestly stated to be only tentative, and the beginning of a greater scheme which will be further developed as more is known about aviation and its value to the Navy and Army. In almost every paragraph of the Memorandum it is shown that the machinery of the scheme is built to allow for unlimited expansion, and even the most captious critic will find very little with which to find fault. It will be easy enough to suggest additions to existing portions of the scheme, and to suggest new points altogether, but there is little or nothing in it which ought not to be there.

So far as this paper is concerned, it is gratifying to find that so many of the matters advocated or foreshadowed in its columns from time to time are included in the official scheme, for this fact goes to show that the information The Aeroplane has been able to give is accurate, while the views advanced on its own account have been soundly reasoned, so that they have coincided with those of the men responsible for the aerial defence of the country.

The confessions of faith at the commencement of the Memorandum are all that they should be, especially when the War Office admits that our need for an efficient aeronautical service is not less urgent than that of the other Powers, and that our organisation must be sufficiently elastic to permit of considerable expansion.

It will be remembered that in these columns doubt was cast on the possibility of producing one flying corps of equal efficiency on land or sea, so it is interesting to see that the Memorandum now issued states that each Service requires an establishment suitable to its own special needs, and that the aerial branch of one Service should be regarded as a reserve only to the aerial branch of the other, which is as it should be. Even in its present embryo state vital differences are made; for example, the whole arrangement of squadrons and flights of aeroplanes is made for military purposes, while it is stated that it is impossible to forecast the ultimate organisation of the Naval Wing. Just by way of being slightly in front of things, it may be worth while hazarding the opinion that as the modern tendency is to make Coast Defence a naval affair, the Naval Wing itself will be sharply divided into two sections, one composed of big, heavy, armed hydro-aeroplanes for coast defence work, and one of small fast machines purely for deep-sea scouting with a fleet in being. The former should be stationed in full squadrons at the naval ports. The latter should be split up into tiny detachments of two, three or four machines, with their complement of pilots and mechanics, and should live on the deep seas, each little detachment forming the aerial equipment of a cruiser or battleship.

Support for Private Enterprise.

No less than three times does the Memorandum refer to the importance of giving encouragement to private enterprise by the process of purchasing machines, training military—but not naval—pilots at proprietary schools, and by subsidising proprietary aerodromes so that the Royal Flying Corps may have landing and housing rights thereon. There are those who regard these references as mere pious opinions designed to quieten agitation, but the writer, having been vouchsafed a modicum of inside knowledge, is assured that they are a definite part of the official policy, though it seems quite probable that the agitation which has been carried on during the past six months or so has had something to do with the formulation of that policy.

It is not to be expected that untold wealth will immediately flow into the coffers of constructors, school proprietors, and owners of aerodromes, but those who can and do build machines of the required standard of efficiency, those who can train pilots quickly and well, and those who run their aerodromes in a businesslike way, may rest assured that they will have plenty of work in the future, but—they have got to show that they are worthy of support before they can reasonably expect any. Builders of obviously inefficient aeroplanes, schools equipped with out-of-date, badly cared for, under-powered machines, and aerodromes with bad surfaces and tumble-down sheds will not get support because they do not deserve it.

It is definitely laid down that military and naval aeroplanes are to be built in Great Britain by private constructors, but, necessarily in a memorandum of this sort, no indication is given as to how they are to be bought or on what lines the selections are to be made; it is therefore to be hoped that the purchasing department of the Royal Flying Corps will, as soon as the staff is appointed, announce definitely that any machine will be purchased after

having passed certain practical tests and having satisfied certain conditions of design, these tests and conditions being made public beforehand so that constructors may know exactly what they have to do.

Though one is naturally anxious to live in peace and amity with everyone, it may still be necessary to agitate and make oneself unpleasant if orders for machines are placed by favour instead of being open to all and sundry purely on the merits of their products, and, unfortunately, signs are not wanting that already certain firms are regarded with more favour than others, and not on account of the pre-eminence of their machines. When, for example, firms which have never built a machine which has flown are *asked* to tender for the present batch of orders, and when firms whose machines have flown tens of thousands of miles are not asked, or are even refused permission to tender in curt, but none too courteous, notes, one may perhaps be pardoned for beginning to feel inclined to think there may be some foundation for venturing to believe the possibility of something being wrong somewhere.

The Reserve.

No provision is made at present for the purchase of machines for the "Reserve," which seems intended to be a section of the Royal Flying Corps based on a system between the Territorials and the old Militia. As the whole scheme is tentative, this does not matter much, for if the Reserve is a success, as seems a trifle improbable, machines must be bought for it, and if it is a failure no harm will have been done. There is also provision for the ear-marking of privately-owned aeroplanes for acquisition by the Flying Corps in case of emergency. This is a bad system, unless the officer in charge of the work is exceptionably able, for it is only likely to lead to the planting of obsolete machines on to the Flying Corps at a time when they need the very best machines available. It is only a new version of the old, old remount troubles, plus the possibility of army contract scandals.

Civilian candidates for appointment to the Royal Flying Corps are to apply to the Commandant of the Central Flying School. Before expressing any very definite opinion on this subject one would like to know what inducements are offered to civilian aviators to join either the Reserve or the permanent establishment as officers. A bonus of £75, for the trouble of getting his certificate, and the pay of a subaltern of Sappers for several weeks in the year, plus the honour of wearing the uniform of the corps, does not seem very tempting to the average aviator, but there may be more behind than is at present announced. And one would like to know who is to be the Commandant of the School.

Incidentally, the writer learns that there will be considerable opportunities offered to young men who are not of sufficient means or social position to become officers, but who are anxious to fly, to join as mechanist-pilots. Some will doubtless join the Reserve, but it is hoped that a number will enlist for the full term of four years. There are at present quite a number of able young men holding pilots' certificates who would no doubt gladly join for the sake of the flying they would get if they could be granted the £75 bonus for getting their certificates, and if they could be given some rank as non-commissioned officers which would not place them quite on the level of the private soldier.

There will also be a demand for really good mechanics with experience of aeroplane work, and one gathers that the "emoluments," to which reference is made in the preamble to the Memorandum, will permit of their being adequately paid, so those who complain that it is hard to get work in connection with aeroplanes after having had workshop experience would do well to inquire further into the opportunities offered.

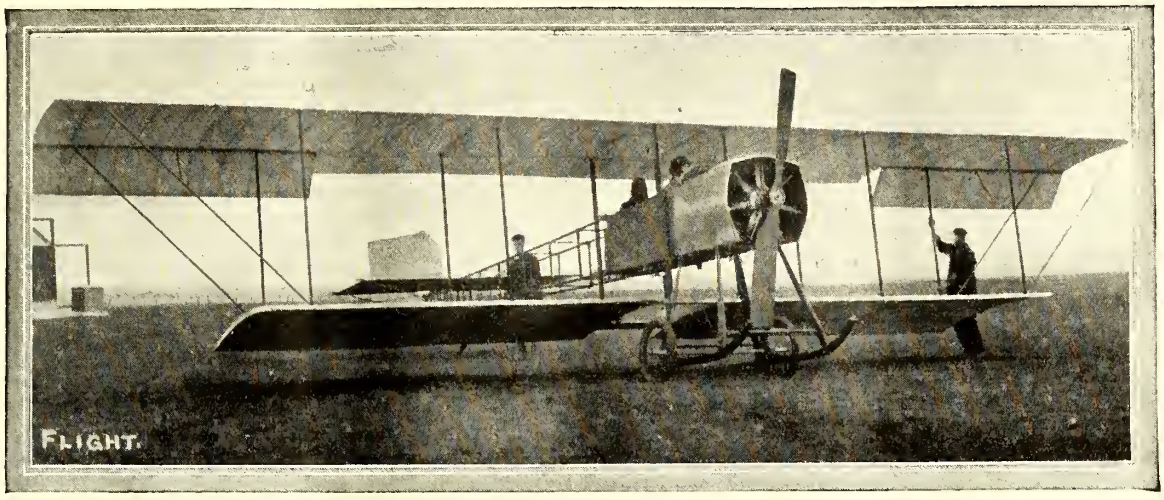
Dirigibles.

It is evident that the Committee which drew up the report from which the Memorandum was evolved are not deeply in love with dirigibles, for the references to them are very non-committal, except in relation to rigid machines for the Navy, in which case it is stated that the prospects of success are not sufficiently favourable to justify the cost: which

(From a photograph kindly lent by the Hon. Lady Shelley.)

The Rumpler Etrich Monoplane as supplied to the German Army.

CONTRACTORS TO THE ADMIRALTY.



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PASSENGER FLIGHTS IN MONOPLANE OR BIPLANE.

is what the writer has been trying to impress on people here and in other papers for the last two years and more. Strangely enough, the Memorandum makes no reference to the one point on which dirigibles really have a big pull over aeroplanes, namely, in their ability to make really long voyages at night, which is just when they have their best chance of finding absolutely calm weather. The writer is no lover of dirigibles, but they have their uses, and if we are going to confine ourselves even for a year to a single squadron consisting of the poor little *Gamma* and the unfortunate *Delta*, we are likely to be badly out of the hunt if war breaks out. The *Clément-Bayard* ought to have been rebuilt ere this, but all we have got for our £12,500 are her engines, the *nacelle* having been "dissembled" with cold chisels and hack-saws, and the envelope disintegrated long ago.

Cross-country Work.

A capital part of the scheme is the intention that a large amount of cross-country flying is to be done. It is pointed out that the present aerodromes are well situated for cross-country flying, and that it would be possible to fly from London to Scotland with fair safety with the addition of a few intermediate points. As it is quite a nice "Circuit of the Aerodromes" could be arranged. Taking Salisbury Plain as the starting point, here is a suggested itinerary—The Plain, Farnborough, Brooklands, Shoreham, Eastbourne, Dover, Eastchurch, Fairlop, Hendon, Huntingdon, Doncaster, Filey, Gosforth (Newcastle), Lanark, Barrhead, Carlisle, Barrow-in-Furness, Blackpool, Freshfield, Waterloo (Liverpool), Dunstall Park (Wolverhampton), Cheltenham, Filton (Bristol), and back to the Plain. All these are either established aerodromes, or are race-courses where flying has already been done, and where landing grounds could be arranged with very little trouble. By the time a Royal Flying Corps pilot had covered the course about twice he might fairly be considered an experienced cross-country flier.

Taking the scheme of the Memorandum as a whole it is excellent, and it is so non-committal that almost any initial errors can be remedied without trouble, as necessity dictates. The technical details of organisation will be discussed in due course by Mr. Whittaker, and these should provide plenty of food for thought.

No one need feel unhappy at the idea of only having 364 pilots and 131 machines. These are only a beginning, and by the time the Royal Flying Corps is in full working order, in twelve months' time, one may be fairly sure that those in authority will be thinking in thousands instead of hundreds.

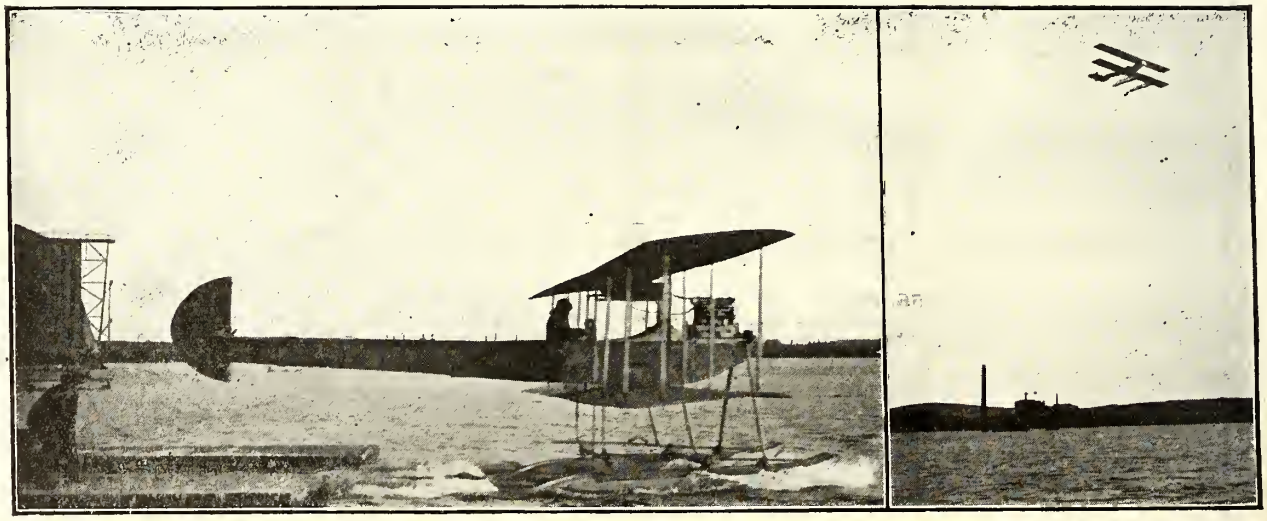
Operations at Farnborough.

Though it is impossible to acquire regular reports of the flying at Farnborough, The Aeroplane is able to state that during the past week or so there has been considerable activity on the part of Mr. de Havilland and Mr. Copland Perry, the two excellent pilots of the Army Aircraft Factory, who have been flying well with the tractor biplanes recently produced. Mr. de Havilland recently flew to Salisbury Plain on one of these machines, and came back at a speed of over 75 m.p.h., with the wind behind him, a fine performance.

Unfortunately, Capt. Burke, who last year did a number of excellent flights on box-kite machines, and also hurt himself in two accidents, had an accident with the first of the tractor biplanes—the one with the Wolseley engine.

The dirigible balloon *Gamma* has now been reinflated, and made a little trip on the calm Wednesday before Easter, without, however, doing anything remarkable. It is also reported that Lord Haldane's hope, the *Delta*, may, with luck, take the air by June.

It will be recollected that some months ago Mr. Mervyn O'Gorman, the chief of the Royal Aircraft Factory, gave an open invitation to all aeroplane constructors to visit the Factory, as he would be pleased to place any information he possessed at their disposal, and it would certainly be a good thing if constructors availed themselves more fully of his invitation. The two new Army biplanes are undoubtedly very fine pieces of work, and contain many points of interest. As may have been gathered from time to time, The Aeroplane has not been wholly in agreement with certain of the doings and appointments at the Aircraft Factory, but it is always glad to give credit where credit is due, and undoubtedly there are among the staff of the Factory a number of exceedingly able men, otherwise, of course, the two biplanes in question could not have been produced; and as Mr. O'Gorman is prepared to place the result of the work of these gentlemen at the disposal of British constructors, there is every reason for independent manufacturers to profit by it. A variety of tests of material have also been made, and certain valuable data have been obtained; and as this work has been done at the public expense—as, of course, it should be—there is the more reason why British constructors who are themselves taxpayers should avail themselves of the opportunity offered.



Mr. Sydney V. Sippe on the Avro-Green hydro-aeroplane at Barrow. On the right he is shown well up over the dock.

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The Training of the Flying Corps.

BY W. E. de B. WHITTAKER.

The Cabinet has provided, even though it be in ungenerous fashion, for the purchase of a number of aeroplanes for the use of the Royal Flying Corps, and nebulous plans have been spoken of as to the organisation of that corps. A competition is to take place later in the year to assist in the selection of machines of the highest efficiency in the dissemination of death amongst the armed forces of belligerent foreign Powers. Parliament and the people have been placated by paper plans, and a resting space has been gained. Perhaps it will be admitted that the time has now come for definite actions. Promises are pleasant, but deeds are of more effect.

In the scheme laid before the House of Commons by Colonel Seely and amplified in debate there are some curious omissions. A sum of £90,000 is to be expended on the purchase of land on the edge of Salisbury Plain far enough in the wilderness for the aeroplanes to be flown at uncouth hours in the morning without disturbing the sleep of the just. But nothing is definitely allocated in the Estimates for the purchase of land in other commands equally important in the scheme of national defence.

The Army has no flying grounds away from Aldershot and Salisbury Plain. The civil aerodromes also are neither extensive enough nor sufficient in number for military needs if the Flying Corps fulfils its purpose.

How it is done in France.

France, in aerial matters the model to which we instinctively look, has its flying corps at work under different conditions. A great number of the strategic points and military camps of that country lie on flat plains and unwooded land. Each camp and fortified city has in its vicinity an extensive manœuvring ground for troops, flat and free from obstacles. Obviously these places are ideal for the purposes of military aviation. Aviators can make a tour of military stations with the certainty of finding suitable landing grounds at the end of each stage of their journeys. Again, in a land of conscription there is a truer sympathy between the soldier and the civilian, so that in France every assistance is willingly extended to the army aviator.

In England the situation is different. Few English garrison towns have in the neighbourhood land suitable for even battalion drill, and the usual parade ground is of small extent, utterly unsuitable as an alighting ground for aeroplanes.

A Case in Point.

To take the case of Chester, the headquarters of the Western Command, there is no manœuvring ground anywhere near the city, and it is therefore impossible to station any regular troops in that part of the command. The only landing ground of any extent near Chester is the Roodee, a low-lying racecourse on the north bank of the River Dee, surrounded on one side by the city walls and on the other by the river, high trees, and houses. Eaton Park, a little farther out, has a few open patches, but at the present time Chester is hardly a promising centre for aviation. And yet it is the headquarters of one of the great commands.

It is therefore of obvious importance that land should be purchased and *military* aerodromes formed in each of the English commands. Each garrison town should have its flying ground with, say, a dozen sheds, workshops, etc. At each civil aerodrome, as has been said before, a number of sheds should be taken for military purposes.

Coast Defence Aerodromes.

There is another point of importance. Poets and others have from time immemorial spoken passionately of the sea as the principal defence of "this fortress built by Nature for herself against infection and the hand of war." The Navy and sea-sickness share equally the credit of defending us from the outer hordes. It should be decided as soon as possible whether the Navy is to take charge of a certain portion of the coast defences or whether these shall still remain in the charge of the Army. The decision of this question will affect the disposition of the aeronautical forces. It would probably be quite good policy to put both the garrison artillery and the coast defence aeroplanes under the control of the Admiralty. In any case, aviation stations must be formed on the sea-coast.

Squadron Commanders and Promotion.

The Royal Flying Corps will probably be placed under the command of an officer holding the rank of colonel or brigadier-general. The squadrons will presumably be captains' commands. Therefore, unless special arrangements are made, the ordinary rules of seniority will cause officers, after they have fulfilled their term in command of an aeroplane squadron, to return to their regiments if seconded or to retire on half-pay otherwise. There will be no chain of promotion between the squadron commanders and the officer commanding the entire corps. Could not each aviation camp be made, let us say, a field-officer's command? This would prevent a block in promotion and would make it possible for a highly efficient officer to remain with the Flying Corps during the greater part of his career and ensure that his specialised knowledge should not be wasted. A somewhat similar system obtains in France. The objection of some critics that officers who specialise in this manner will be unsuitable for high command later in their career applies equally to officers of the Royal Engineers, yet that corps has provided general officers of distinction from time to time. Field Marshal the Viscount Kitchener is a case in point.

Each arm of the Service has to undergo special training in addition to the training common to the entire Service. Cavalry are not educated in the building of bridges nor the digging of drains; neither is Artillery practice carried out on a parade ground. A new arm such as the Royal Flying Corps has to train in a method entirely different from any other corps. Flights have to be made over large and varying tracts of country and new routes have to be found continually that experience may be extended. Transport has to be treated under all conditions.

The Training of Detachments.

Salisbury Plain will, it has been announced, be the headquarters of the entire corps. The Central School is also to be stationed there. When a man leaves the school he ought to have reached the stage when aerodrome flying can add little to his knowledge and when he is fairly well grounded in the different subjects necessary to a military aviator. His elementary individual education has ceased, and his training as a member of a detachment begins. He has to learn to work in with other members of a squadron, so that the composite efforts of that body are unified and definite. And here it is that the system of general training of the Royal Flying Corps matters so much.

Such aerodrome work as they do will be simply for the testing of machines and to keep in practice. Their training lies farther afield. The early French custom was to allow individual officers to make a tour of the aviation camps, perhaps alone or perhaps with one companion. This system has, during the last month or two, been succeeded to some extent by tours of entire *escadrilles*. In France, as in England, the *escadrilles* exist chiefly on paper, so that definite training has not begun on a large scale. But these are signs of the direction to be taken in practice.

Squadron Journeys.

Would it not be well in England if the squadrons of the Royal Flying Corps, three or four months after

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their formation, made a series of journeys round the circuit of such aviation camps as are mentioned in the first portion of this article? At present, of course, it would be a case of the about-to-be-born flying round the realms of the non-existent.

In this manner the transport system could be thoroughly tried, and each aviator in the squadron would get extended experience of strange country. All possible repairs would be made by the squadron mechanics and from the resources of the squadron transport. Each bad day the aeroplanes would be packed in their wagons and the march would proceed. In this way the squadron would obtain excellent practice in the rapid assembling of aeroplanes. Each officer flying could make extended notes and observations, which would later be of great use to him for reference purposes. One result of such tours, apart from their training value, would be the popularisation of aviation, provided there were not too many landings in flourishing cabbage patches.

But even a brief survey of the subject shows the immense amount of work to be carried out and paid for before England has an efficient "fifth arm." The purchase of aeroplanes, though most important, is not the only matter of moment. There is no time for mutual recriminations, and abusive articles in the daily Press, supported by innumerable inaccuracies, do more harm than good.

French Military Aviation.

General Roques, who has done so much in the past three years for the cause of military aviation, has at last retired from the post of Inspector-General of Military Aeronautics. He has been succeeded by Colonel Hirschauer, Commandant of the *Sapeurs-Aérostiers* at Versailles. Colonel Hirschauer is responsible for the creation of the existing military aviation centres. The selection of this officer for the supreme command of the air corps is a gratifying sign of the good intentions towards military aviation of the Ministry of War. General Roques has been appointed to the command of the 7th Division at Paris.

Lieutenant-Aviator Maillols on April 6th arranged for the opening of a school of military aviation at Montpellier, at which place is stationed the 16th Army Corps (General Faurié). Captain Eychel, 2nd Engineers, and Lieutenant Chenau begin their training at once. It is also intended to make experiments with hydro-aeroplanes near Montpellier, and hangars are to be erected for their housing.

Lieutenants Tretarre, Do-Hû, Van den Vaero, of the Aviation Centre at Fez, have been making magnificent flights at Tangier. The Annamese Lieutenant-Aviator Do-Hû, despite his name, has particularly distinguished himself. After flying for some time at a height of over 3,000 feet, he descended in a faultless *vol plané* to a height of 100 feet. The local Moors, it is reported, were pallid with excitement.

The experiments of the aviation section at Mailly Camp still take place from day to day. On April 3rd they tested in the daylight the signal fuses designed by Captain Meyer. Lieutenant-Aviator Battini, with Lieutenant Lerévérend as operator, fired from his aeroplane some fuses which were visible from a distance of eight kilometres in spite of the high wind.—W. E. de B. W.

German Military Aviation.

Two new dirigible balloons, a Zeppelin and a Parseval, will shortly be added to the German aeronautical service. The former will be numbered "Z3," and will be stationed at Koenigsberg. It will be 455 feet in length, and its cubical capacity will be 19,000 metres. The expected speed is about 60 kilometres an hour. It will have three motors; in all 450 h.p.

Four military aviation camps have been formed on the Russian frontier at Posen, Breslau, Thorn and Graudenz.

The aviation stations at Metz and Strasbourg have at last been officially created, the former on April 12th and the latter on April 14th. At Strasbourg there are twelve aeroplanes, the monoplanes under the command of Lieutenant Bahrens and the biplanes under Lieutenant von Wilberg. At Metz there are six monoplanes and eight biplanes, Taube-Etrich, Aviatik and Albatross. Four officer-aviators will be attached for service. All the new machines have motors of 100 h.p. and over. Machines of less power will be used for school purposes.—W. E. de B. W.

Russian Military Aviation.

The headquarters of the Russian Air Corps is at the Aeronautical School at St. Petersburg, where there is a class of thirty-five officers and an aeronautical battalion of two companies, the first for free balloons and the second for dirigibles. In summer an aviation class is formed. The personnel for the aeronautical sections stationed at different towns and fortresses is drawn from the St. Petersburg school. Of the fifteen sections or companies, two are on the western frontier, attached to the Brest-Litovsky Battalion, and two form a battalion at Vladivostok. The eleven others are distributed over the country.

Russia has at present ten dirigibles, as follows:—

At St. Petersburg.

(1) *Lébéj.*—Lebaudy, built in France 1909, 100 h.p., 3,500 cub. metres.

(2) *Krétchét.*—Lebaudy type, built in Russia 1910, two motors of 100 h.p. each, 5,680 cub. metres.

(3) *Goloubj.*—Astra type, built in Russia 1910, 75 h.p., 2,270 cub. metres.

(4) *Solak.*—Astra type, built in Russia, 100 h.p., 2,500 cubic metres.

(5) *Kobtchik.*—Astra type, built in Russia, two motors of 45 h.p. each, 2,150 cub. metres.

On the Western Frontier.

(6) *Clément-Bayard I.*—Built in France 1909, 100 h.p., 3,500 cub. metres.

(7) *Zodiac VII.*—Built in France 1910, 60 h.p., 2,140 cub. metres.

In the South.

(8) *Parseval.*—Built in Germany 1910, two motors of 110 h.p. each, 6,700 cub. metres.

(9) *Zodiac VIII.*—Built in France 1910, 60 h.p., 2,140 cub. metres.

And one which is being despatched to Vladivostok: (10) *Iastréb,* Astra type, built in Russia 1910, 75 h.p., 2,500 cubic metres.

The Russian War Office intend in future to order Russian-built dirigibles exclusively, only the motors being purchased abroad.

There are twenty aeroplanes, principally Farmans and Blériots, at the St. Petersburg School. Three or four have been built in Russia, and the remainder in France. The War Office has ordered from Russian constructors (the Stchetinine factory at St. Petersburg, the Baltic factory at Riga, and the Duix factory at Moscow) thirty Farman type (No. 7) biplanes, and fourteen Blériot type monoplanes, all with 50-h.p. Gnôme motors. Messrs. Séguin have opened works in Moscow for the construction of Gnôme motors, and M. Chauvière has also arranged for the manufacture of propellers.

Last summer fifteen Russian officers took their certificates as pilots. This year a class will be formed of thirty-five officers and twenty-five N.C.O.'s, all of whom it is hoped will become military aviators before the end of the year.

The Corpousny Aerodrome at St. Petersburg is intended for the training of pupils, and the Gatchina Aerodrome for the advanced practice of pilots.—W. E. de B. W.

Italian Notes.

Lieutenant Aldo Bertoletti, who recently lost his life at Somma, was flying a Blériot-type craft, which he got into a vertical position when close to the ground. A temporary jamming open of the accelerator control is suggested when he was gliding down with engine throttled down. Nothing could be found broken of the controls when the wreck was examined.

Also at Somma Cobioni continues to do wonderfully well, having beaten the 300-kilometre record held by the late Pierre Marie Bournique last week on a 50-h.p. Caproni monoplane. He succeeded in flying 330 kilometres in 3 hours 3 minutes, using, roughly, 10 gallons of spirit on a circuit of only 5 kilometres.

Great activity is being shown by the military section, who have now got Piazza back among them at Somma, as I predicted last month. Several fine flights have been done; indeed, they are becoming too common to merit mention. The formation of a distinct flying battalion, with headquarters at Turin, whose civil aerodrome has thus become the

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third military school in Italy, has been decided upon, and appointments are already made to it.

The earlier particulars of the Government competition are confirmed. The date is fixed for April of next year, and £4,000 will be given as prize money. A great national effort to provide the forces with numbers of aeroplanes is doing wonderfully well. Large sums, nearing a million francs, and several gifts of machines are promised, the universities leading the battle, and the sporting clubs backing them up.

The Antoni monoplane, piloted by Dr. Cavalieri, attended the funeral of a well-known electrical scientist at Pisa a few days back, dropping the customary floral tribute. The photograph of this exploit which the firm send me shows clearly the variable planes, which are jointed so that both incidence and (can I say?) the *inverted* camber are adjustable to suit different conditions.

The Paulhan Tatin Patents Company is said to have now acquired rights of manufacture from Hanriot, certain Nieuport patents being held by the Hanriot manager, I understand.

The first Italian dirigible disaster has occurred, and only shows that their luck has not changed. Usuelli's little Spa-engined balloon got into a hurricane recently, lost control of the elevator, and ultimately deflated, and only one of the five on board suffered any serious hurt; nor is the balloon much damaged.

From the war the military dirigibles report great successes, and aerially they have done well, but "who goes awarring without an enemy can do many fine deeds."

In a most interesting account of his experiences Cagno, who is now back with Lancia at Turin, is reported to say that he found the high-powered electric stations (the wireless?) caused his Gnôme to misfire violently when in their neighbourhood. One recollects Marra's fall when near the wires carrying a powerful current to Rome. Will others who know something please oblige?—T. S. Harvey.

Continental Notes.

There is to be an international aviation meeting at Vienna beginning on June 22nd and coinciding with the *Exposition Internationale Aèronautique d'Autriche*. The participation of French manufacturers and pilots is doubtful. The prizes offered are too insignificant to be considered seriously. The executive is under the impression that retainers of £40 each are sufficient to attract innumerable French aviators of the highest distinction. Simplicity is indeed a virtue, but success is not always to the virtuous.

Weymann, the heir of many races of mankind, has no definite plans for the coming summer. He flies from time to time at Villacoublay, but of late has made no lengthy cross-country journey. He holds, in common with many other well-known aviators, the belief that the hydro-aeroplane will dominate the future of aviation. He intends to construct and fly a hydro-aeroplane during this summer. Of his participation in the Gordon-Bennett he is doubtful, and the Grand Prix of the Aero Club has no great attraction for him.

The Borel hydro-monoplane will shortly undergo its trials on the River Seine at Port Marly, near St. Germain-en-Laye. Verrept, the chief pilot of the Borel firm, will take charge of the machine himself. I believe this is only the third hydro-monoplane to be tried, the Fabre aeroplane which was flown in the estuary of the Seine during the summer of 1910, and the monoplane of Mr. Gnosspelius, at present located on Windermere, being the two previous examples of the type. The Borel monoplane has three floats, two, each of three metres in length, under the chassis, and replacing the customary wheels, and a small one under the tail.

The aviation meeting at Nancy, organised by *Le Matin* in aid of the national subscription for the purchase of military aeroplanes, took place amidst great enthusiasm on April 7th and 8th. The participants were Moineau (Bréguet biplane), Bedel (Morane monoplane), Loridan (H. Farman biplane), Kuhling (Blériot monoplane), Gordon Bell (R.E.P. monoplane), Prévost (Deperdussin), Gobé (Nieuport monoplane), and Kimmerling (Sommer monoplane). Lieut.-Aviator Cheutin (M. Farman biplane) flew over from Bar-le-Duc to be present at the meeting, in which he could take no active part owing to his official position. At noon on the 6th Lieut.-Aviator Nicaud also arrived from Bar-le-Duc. During the evening Bedel and Gordon Bell flew over Nancy several times. On both days of the meeting the different aviators made a series of excellent flights. As may be understood, it is impossible to differentiate between the flights or even enumerate them. As much flying as was possible was done in the two days of the meeting. Mr. Gordon Bell quite adequately represented Brighton aviation. Brittany and Normandy are to receive visits from this band of aviators at a later date.

The *Commission Sportive Aéronautique* of the *Aéro Club de France*, under the chairmanship of M. le Comte R. de Vogué, confirmed on April 5th the following records:—

Speed (aviator alone).—J. Védrines, February 22nd., at Pau: 10 km. in 3 m. 23 1-5 secs.; 20 km. in 7 m. 27 secs.; 30 km. in 11 m. 10 2-5 secs.; 40 km. in 14 m. 54 2-5 secs.; 50 km. in 18 m. 38 3-5 secs.; 100 km. in 37 m. 22 2-5 secs.; 150 km. in 56 6m. 57 secs.; 200 km. in 1 hr. 15 m. 20 4-5 secs.

Highest Speed.—161 km. 290 m. an hour.

Time: 15 minutes, 39 km. 304; 30 minutes, 79 km. 304; one hour, 159 km. 304; all on the Deperdussin.

Records established by Maurice Tabuteau at Pau, February 23rd:—

Time: Two hours, 227 km. 454; on the Morane-Saulnier.

Records established by Jules Védrines at Pau, March 1st, 1912:—

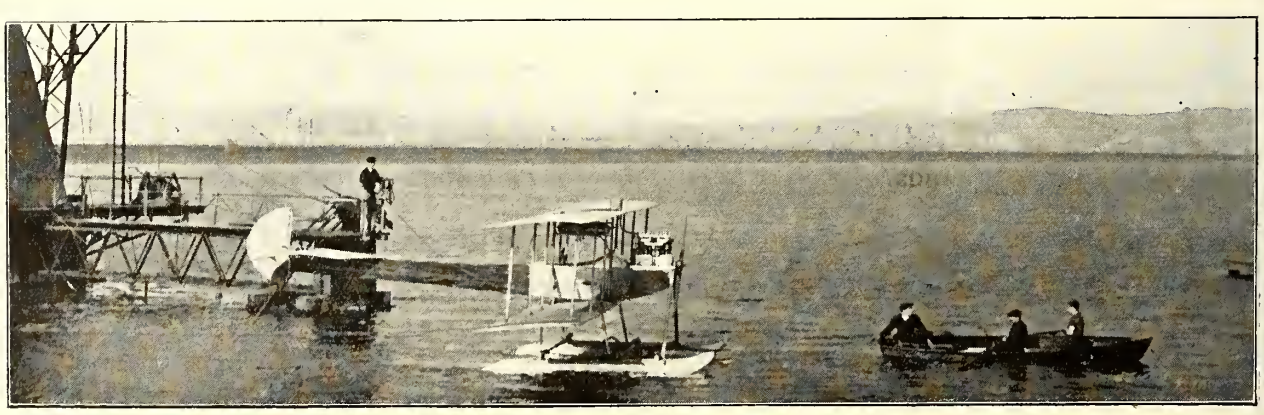
Speed: 10 km. in 3 m. 35 4-5 secs.; 20 km. in 7 m. 14 secs.; 30 km. in 10 m. 53 4-5 secs.; 40 km. in 14 m. 32 1-5 secs.; 50 km. in 18 m. 10 2-5 secs.; 100 km. in 36 m. 23 1-5 secs.; 150 km. in 54 m. 37 3-5 secs.

Greatest Speed: 166 km. 821 an hour.

Time: ¼ hour, 40 km. 373; ½ hour, 80 km. 374; 1 hour, 164 km. 331; on the Deperdussin.

Italy, following the example of France, has its own national subscription for the purchase of aeroplanes for the Army. The towns of Palermo, Catania, Naples, Rome, Florence, Ancona, Bologna, Leghorn, Genoa, Milan, Turin, Venice, Brescia, and Verona have each subscribed an aeroplane. A union of banks has also provided ten aeroplanes and two dirigibles. Six aeroplanes have been presented from private sources. The Italian colonies in Tunis, Alexandria, Buenos Ayres, São Paulo, Santos and New York are each responsible for an aeroplane.

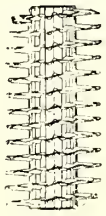
On April 13th at Laimont, near Bar-le-Duc, Lieutenant-Aviator Boncour was killed. He was flying from Reims to an unstated destination and apparently decided to make a landing near Laimont. Owing to his defective sight it seems that he did not know he was over a forest until about 150 feet from the ground. He then straightened up his monoplane, but the engine did not restart.



Commander Schwann's Avro-Green Biplane, which Mr. Sippe is flying at Barrow-in-Furness.

THISTLE BRAND
AEROPLANE
HIGH STRAIN PLATED STEEL
F S & Co
TENSION WIRE
CYCLE TYRE WIRE — SPRING WIRE
HIGH CLASS STEEL WIRE OF ALL KINDS
FREDERICK SMITH & CO.,
WIRE MANUFACTURERS LTD. HALIFAX, ENGLAND.

Let your Repair Outfit include the means of repairing yourself.
'TABLOID' FIRST-AID
(TRADE MARK) BRAND
Ideal aviators' outfits of bandages, etc. Light; compact.
No. 715 Outfit, 10/6 *All Chemists*
BURROUGHS WELLCOME & CO., LONDON


SPIRAL TUBE RADIATORS
FOR AEROPLANES
Here is proof of Efficiency. The 'Green" Engine which entered for the Patrick Alexander International **24 Hours' Trial** was fitted with a Spiral Tube Radiator and showed **No Loss of Water.**
Write or 'phone 2633 North to-day for Catalogue.
SPIRAL TUBE & COMPONENTS CO.,
24-24A, CALEDONIA STREET, KING'S CROSS, N.

GREEN ALL-BRITISH - AERO - ENGINES
£1,000 Patrick Alexander Prize Winner
This open-to-the-world 24 HOURS' INTERNATIONAL COMPETITION supplied about the severest reliability test for aero engines yet devised.
The RELIABLE 50-60 h.p. GREEN ENGINE won it with the following performance :— 24 continuous hours run, developing 61·6 h.p. at 1,150 r.p.m.; throttle absolutely untouched from start to finish. This constitutes a World's Record for Internal Combustion Engines.
We Guarantee ANY Green Engine to Duplicate the Performance.
Write to-day for Details and Latest Prices.
The GREEN ENGINE Co. 55, BERNERS STREET, LONDON, W.
MAKERS FOR THE PATENTEES: THE ASTER ENGINEERING CO., LTD.
E.H.G.

REPAIRS
To the Gnôme or any other make of aero engine
Damaged engines rebuilt, and nothing but workmanship of the highest possible standard, by
HESSE & SAVORY
ENGINEERS
TEDDINGTON, S.W.

The Oil which gives the Best Results.
STAERO is an oil produced specially for aeroplane engines. It retains its full lubricating qualities at the highest speeds. Its use gives confidence because the aviator *knows* that he will not be stopped through lubricating troubles. **STAERO** gives great efficiency and speed, with utmost economy in working. The aviator who uses **STAERO** is not troubled with smoke or carbon deposit.
Write for full particulars and name of nearest agent.
THE STERN SONNEBORN OIL COMPANY, LTD.,
54, Royal London House,
Finsbury Square, London, E.C.
STAERO for Aeroplanes

The Deperdussin's Cross-Channel Flight.

By their flight from Paris to Eastchurch on Saturday last M. Prévost and Mr. Lawrence Santoni put up a record of their own by being the first pair to fly from Paris to England in the day. Incidentally the flight is a fine example of how fortune sometimes favours the brave.

The machine was the first foreign machine ordered by the Admiralty, and Mr. Santoni determined that it should be the first to be delivered, and that it should be delivered by air. It so happened that the machine was ready for delivery just before the flotation of the British Deperdussin Company, so obviously a notable flight would be no bad advertisement for the machine. Therefore, taking his courage in both hands, Mr. Santoni made a bold bid for fortune, and won through. May it be a happy omen.

To the superstitious the omens were unfavourable, for Mr. Santoni told the writer just after the big flight that, by a strange coincidence, he and M. Prévost, stopping in two different hotels in Paris on the Thursday and Friday before the flight, were both given rooms numbered 13. Also, the machine was only completed on the Friday morning, and Prévost took it out for trial the same afternoon. He then took up Mr. Santoni as passenger over Paris at 2,000 ft., the machine flying beautifully. Then on the 13th the flight itself was made.

They started from Paris at 7 a.m., intending to go by Amiens, Abbeville, and the coast to Calais, but owing to mist Prévost changed his mind and kept inland. Mr. Santoni, in charge of the pressure pump for the petrol feel, was cramped up by his suit-case and a barograph, and so could not turn round to pump in comfort. After nearly three hours' pumping, and not seeing the sea as he expected, he concluded that Prévost had lost his way, so he gave up pumping and signalled Prévost to come down. Prévost, thinking he was ill, came down at Ardres, only eight miles from Calais, at 9.45 a.m. Both pilot and passenger were nearly frozen stiff, so after warming themselves they left again at 10.45, and reached Calais ten minutes later. Here they lunched in comfort, and left at 12.5 p.m., reaching Eastchurch at 12.45 p.m.

From Calais to Deal, after passing near Dover, took only 24 minutes. They lost sight of land very shortly after starting, but so true was their course that they met the midday cross-Channel steamer halfway across, and sighted the cliffs of Dover a few minutes later. They passed to the right of Canterbury and soon arrived at Eastchurch. Mr. Santoni said he was never so glad to end a journey as he was that one, for though everything went perfectly he was playing for high stakes, and a smash through a forced landing on bad ground would have meant not only a serious delay in delivering a new machine to the Admiralty, but would very possibly have affected adversely the future of the new company.

Almost immediately after the arrival of the machine Lieut. Longmore, R.N., took it out to test it, and was evidently so pleased with it that he forthwith set off to Sheerness and evoluted over the fleet with it. Then he came back and took up Lieut. Spencer Grey, R.N., as passenger, the pair going up to 3,500 feet, so evidently the machine did a good day's work.

In general arrangement the machine is similar to that supplied to the Army, but it has a 70 h.p. engine instead of a 60 h.p. The fuselage is wider and more comfortable, and the body work is generally better. The span of the machine is 34 feet, and the wings are cut out close to the body so that both pilot and passenger have a good view vertically below them.

M. Prévost, the pilot, will be remembered for his magnificent flying in the French Military trials, especially in landing and getting out of the ploughed field. He also put in several great flights on Deperdussins for the Michelin Cup, and was only beaten by Hélén by the luck of the weather. Some idea of the work he does may be got from the fact that on Sunday and Monday of last week he was flying at Nancy, On Wednesday he was testing machines for the French Army at Reims. On Friday he was testing the British Navy's machine at Paris. On Saturday he flew it to Eastchurch, and on Sunday he was flying again at Rennes in Brittany. Truly a strenuous life.

It may be well to remember that the Deperdussin holds all the speed records up to over an hour, and the idea that they have been won simply on a freak racing machine is disposed of by the fact that the 100 h.p. racer on which Védrines captured so many records was flown by him for 2,000 kilometres in one month at Pau.

The reliability of the Deperdussin has been further demonstrated during the week-end by the fine flying of Mr. Sabelli, who on Sunday flew for 75 minutes on a little 35-h.p. machine at Brooklands, reaching a height of 1,300 feet. Mr. Ewen at Hendon flies his little 28-h.p. Deperdussin across country in a way which should be a lesson to most aviators with 20 h.p. more, and it must be recollected that the machine on which he does it is the same on which he flew from Lanark to Edinburgh over the Lammermuir Hills, and afterwards flew across the Firth of Forth and back.

This latest success of the Deperdussin is a happy augury for the future of the new company which makes its appearance this week.

The American Circuit.

The Aero Club of America, with the co-operation of the Aero Clubs of Illinois, Michigan, Milwaukee, Kansas City, St. Louis, Indiana, Cincinnati, Ohio, is organising an aeroplane circuit of 1,810 miles, which will be held in the month of August and will be known as the "Great American Circuit."

Chicago will be the starting and finishing point. The route proposed is Chicago, Milwaukee (80 miles), Cedar Rapids (200 miles), Des Moines (120 miles), Omaha (100 miles), St. Joseph (120 miles), Kansas City (40 miles), Jefferson City (125 miles), St. Louis (100 miles), Charleston (125 miles), Indianapolis (100 miles), Cincinnati (100 miles), Columbus (90 miles), Cleveland (130 miles), Toledo (100 miles), Detroit (60 miles), Chicago (220 miles).

There will be a "control" at each of these towns, and possibly at others along the route. The Circuit is to be open to licensed pilots of all nationalities who will be free from injunction under the Wright Patents.

The prizes will probably amount to $100,000, and will include a Grand Prize of $25,000, second prize $5,000, third prize of $2,500. Among the other prizes to be given are: Prizes for first and second machines to reach each control; a special prize for American built and flown machine first to arrive. Special prizes for: (*a*) Least horse-power to complete course; (*b*) passenger carrying; (*c*) first to flash a wireless message to a control; (*c*-1) greatest number of wireless messages delivered; (*d*) best map made *en route* and description of conditions, etc.; (*e*) first aeroplane fitted with stabilizer to arrive; (*f*) most completely equipped machine.

The American Circuit will thus include features never before included in aerial contests. All previous circuits have been essentially races for speed between two points. No effort was made to bring out the qualities of aeroplanes other than speed. Thus while the splendid performances created a great deal of enthusiasm, there was really little of practical value brought out that the world did not know or that would bring the aeroplane nearer to the average man for general use. In the American Circuit every inducement is given to demonstrate the practical side of aviation. Using less horse-power; carrying passengers over a long distance; using wireless telegraphy for communicating from aeroplanes; using automatic stabilizers and less human element, and having aeroplanes fitted with scientific instruments for travel and devices to promote comfort—these are all practical features which, when applied, will make the aeroplane cheaper, safer, and a vehicle of service as well as pleasure.

The Progress of Invalids.

Captain H. E. Watkins, writing from 3, Nottingham Place, W., where his leg was operated on, and where he has since been in hospital, says he has been having rather a bad time until recently, owing to his leg going wrong and suppurating after the bone had been spliced. However, he says it is nearly well again. The splints were taken off on Thursday last, and he is able to move his leg with comparative comfort. He expects to be about on crutches in a few days, and altogether he has made a very satisfactory recovery. He desires to be remembered to all at Brooklands.

Mr. Furbank is still in hospital at Weybridge, his concussion having been much more serious than was at first thought. He still has intervals of unconsciousness, but, on the whole, he is doing well. His case is in many respects similar to that of the Hon. Alan Boyle at Bournemouth.

Lieutenant Seddon, R.N., is now able to get about with the aid of a stick, and told the writer recently that he had hopes before long to start flying again.

This Prospectus has been filed with the Registrar of Joint Stock Companies.

THE

BRITISH DEPERDUSSIN AEROPLANE

COMPANY, LIMITED.

Incorporated under the Companies (Consolidation) Act, 1908.

CAPITAL - - - £60,000

DIVIDED INTO

50,000 6 per cent. Cumulative Participating Preference Shares of £1 each (after providing for a 6 per cent. Dividend on the Ordinary Shares the surplus profits are divisible equally between both classes of Shares) - - **£50,000**

10,000 Ordinary Shares of £1 each - - - - - - - - **£10,000**

£60,000

ISSUE OF

30,000 SIX PER CENT. CUMULATIVE PARTICIPATING PREFERENCE SHARES OF £1 EACH AT PAR,

PAYABLE AS FOLLOWS:

2s. 6d. per Share on Application; 7s. 6d. per Share on Allotment; 5s. one month after Allotment; 5s. three months after Allotment.

10,000 Ordinary Shares of £1 each will be allotted as fully paid to the Vendors as part of Purchase Consideration and for services in connection with the formation of the Company.

20,000 of the Cumulative Participating Preference Shares are being reserved for future issue.

The Articles of Association provide for the issue of Share Warrants to Bearer in respect of fully paid Shares.

Board of Directors.

Admiral the Hon. Sir EDMUND ROBERT FREMANTLE, G.C.B., C.M.G., Rear Admiral of the United Kingdom, 44, Lower Sloane Street, London, S.W. (*Chairman*).

Colonel WYKEHAM CORRY DICKENSON, 22, Hereford Square, South Kensington, London, S.W. (Chairman George Williams Press, Limited).

Monsieur ARMAND DEPERDUSSIN, 26, Avenue de Villiers, Paris, Manufacturer.

Lieut. JOHN CYRIL PORTE, late R.N., 6, Champion Park, London, S.E., Cert. Aviator.
DOMINIC LAWRENCE SANTONI, Esq., 10, Coburg Place, Kensington, W., Cert. Aviator. } *Joint Managing Directors.*

Technical Adviser.

Monsieur M. BECHEREAU, 19, Rue des Entrepreneurs, Paris, Technical Director of the *Deperdussin Works in Paris* and Designer of the *Deperdussin Monoplane.*

Bankers.

LONDON COUNTY AND WESTMINSTER BANK, LIMITED,
Covent Garden, London, W.C.,
21, Lombard Street, E.C., & Branches,
and Head Offices:—41, Lothbury, E.C.

Brokers.

JOHN INCHBALD & SON, Gresham House, Old Broad Street, E.C., and Stock Exchange, London.

Solicitors.

A. J. GREENOP & Co., Bush Lane House, Cannon Street, London, E.C.

Auditors.

JOHN R. WOODLEY & Co., 39/41, Wood Street, London, E.C., Incorporated Accountants.

Secretary and Registered Offices (pro. tem.)

H. E. R. THOMPSON, 30, Regent Street, London, S.W.

PROSPECTUS.

Object.

THIS Company has been formed for the purposes stated in the Memorandum of Association and primarily—

(1) To acquire the Patents for the United Kingdom and Sole Manufacturing Rights for the British Empire of the Deperdussin Aeroplane and all future developments originated by Monsieur A. Deperdussin in the construction of Aeroplanes.

(2) To take over the well-established business of the British Deperdussin Aeroplane Syndicate, Ltd., of 30, Regent Street, London, S.W., as Aeroplane Constructors and Experts, including the Syndicate's fully-equipped Aviation School at Brooklands.

(3) To provide the Additional Working Capital necessary to develop the business and to be in a position to favourably compete for and carry out a share at least of the large orders the British Government contemplate giving at an early date to manufacturers of Aeroplanes in England.

Performances and French War Office Competition.

"The DEPERDUSSIN" now ranks foremost amongst flying machines. Already a large number of British Aviators have flown the DEPERDUSSIN Monoplane, including James Valentine, Lieut. J. C. Porte (late R.N.), W. H. Ewen (who recently flew the Firth of Forth), Lieut. Napier Gill, R.A., Lieut. Wilkins, Lieut. Chinnery, Capt. Hamilton and G. W. Dyott, the latter on a two-seater recently purchased from the British Deperdussin Aeroplane Syndicate, Ltd., established a record on December 1st, 1911, in taking up at Mexico City as a passenger, President Madeiro, the first Ruler to go up in an aeroplane.

The following are amongst some of the most prominent Continental Aviators who are flyers of, and who have accomplished some excellent performances on this machine:—Védrines, Prevost, Aubrun, Vidart, Busson, Laurens, Bielovucei, Crombez, Wynmalen, Pascal, Legrand, Baron de Francq, Comte d'Hespel, Rivollier, Serviès, etc., also numerous officers in the French, Russian, Spanish and Italian armies and navies are pilots of the DEPERDUSSIN.

The DEPERDUSSIN Monoplane came very prominently before the public in the recent French War Office Military trials held at Rheims during the months of October and November, 1911. Two of these machines, which were classified in these tests, gave the best results for altitude and getting off ploughed fields. PREVOST on his 100 h.p. Gnôme engined DEPERDUSSIN Monoplane climbed 1625 feet in 9 minutes 2 seconds, and VÉDRINES on his 80 h.p. Anzani engined DEPERDUSSIN Monoplane got through the ploughed field test with 40 yards run, both achievements being most remarkable, considering the weight of the machines—over 1,600 lbs.,—and a dead weight of 660 lbs. which had to be carried in accordance with the regulations of the Competition.

Noteworthy amongst the numerous performances achieved by pilots flying these machines are the following:—

Paris-Rome Race—Vidart 4th—the only competitor to complete the whole race on the same machine.

Paris-Liege-Utrecht—Vidart 1st.

Calais-Paris—Vidart 1st.

European Circuit—Vidart 3rd Although only 3rd in the completion of this race, Vidart was the first in various sections of the Circuit.

The "Daily Mail" Circuit—Valentine 3rd. This was the first British aviator to complete the whole course of this race (1,010 miles).

In the Competition for the Michelin Cup in September last, two Deperdussin pilots MARCEL PREVOST and PASCAL covered 530 miles in 8 hours 15 minutes, and 520 miles in 8 hours 13 minutes respectively.

World's Records:

Speed.

Védrines on Thursday, the 29th February, 1912, secured on a DEPERDUSSIN Monoplane all the World's Speed Records up to 106½ miles per hour and all Distance Records up to one hour, thus beating the DEPERDUSSIN previous records, establishing it as being by far the fastest aeroplane in the world.

The World Speed Records while carrying 1, 3 and 4 passengers.

Altitude.

MARCEL PREVOST, on December 3rd last accomplished a world's record for altitude flight with one passenger, rising to a height of 9,800 ft. in 55 minutes on the military three-seater Deperdussin Monoplane, which took part in the French War Office Competition.

On the 20th January, 1912, he took up 2 passengers on the same machine, 7,200 feet in 30 minutes, thus adding to his previous performances the World's Altitude Record with 2 passengers.

British Government.

The British Army estimates recently issued show that the Government, having adopted a definite scheme of Aviation for the Navy and Army, have provided for 131 machines for the Army during the present year, and as regards the Navy the First Lord in discussing the Naval Estimates stated in Parliament on March 18th: "I can assure the House that the greatest importance is attached by us to a thorough and effective development of this service, and money will not stand in the way of any necessary steps." The Deperdussin Monoplane being manufactured in England, and at the same time having the benefit of all patents, improvements and development of one of the largest and most progressive of aeroplane construction companies in France, this Company may reasonably be expected to receive a substantial share of orders.

Orders in Hand.

The British War Office having already purchased a Deperdussin from the Vendor Syndicate, has now approached the Syndicate for the supply of several more Deperdussin Monoplanes.

The British Admiralty has also ordered a two-seater Deperdussin of the very latest type.

The benefit of the above contract and pending negotiations for other orders are included in the sale to the Company.

British Empire.

The requirements of the British Empire should be much greater than those of other countries, owing to the number of Colonies and Dependencies to be protected, and it is estimated that within the next two years at least a thousand machines of all types will be required.

Inquiries have already been received from the largest Colonies of the Empire, proving the far-reaching interest now being taken in aviation, and the world-wide reputation of the Deperdussin Monoplane.

Other Governments Using Deperdussin Monoplanes.

The Italian, Russian and Belgian Governments have acquired several of these machines, the former Government having obtained practical proof of the value of aeroplanes in actual warfare during the Tripoli War, where Italian Aviators have not only proved themselves invaluable in locating groups of the enemy, directing the fire from the ships in the operations, but succeeded in scattering detachments by means of bombs dropped from aeroplanes whilst flying at a considerable height.

The Turkish Government has also been supplied with two Deperdussin machines for their Military School at Constantinople.

The French Government at the present time owns at least 300 aeroplanes with a full complement of pilots, whose exploits in reconnoitring work during the French Army Autumn manœuvres drew the admiration of all observers, and it has already ordered, as a result of the Rheims Military Competition, Four three-seater (at a price of 40,000 frs. each), Ten two-seater and Nine Single-seater Deperdussin Military Monoplanes, and a further order for fifty machines is expected to be placed in the immediate future.

The latest information is that the French Government has asked for a credit of frcs. 22,000,000 for Aviation, and the Superior Council of War has decided to order 328 Monoplanes and Biplanes for Army use in addition to those already in existence.

Aviation School.

The Deperdussin Aviation School at Brooklands is the best equipped Monoplane School in the Empire, having five machines, including two specially constructed for safety in instruction, and is proving most successful in training pupils.

The Company is in a position to forthwith train Officers of the Navy and Army, the Government having decided that all Officers desiring to join the Military Flying Corps are to qualify for their certificates as Aviators at civilian aviation schools.

The sale of machines will necessitate the training of numerous other pilots and pupils, and a considerable revenue should be derived from the above sources and also from Exhibition and Passenger flights.

Managing Directors.

The Company has secured the services of Lieut. J. C. Porte, late R.N., and Mr. D. Lawrence Santoni, two well-known aviators, as Joint Managing Directors for a term of three years.

Works.

The Company will acquire as part of the property purchased from The British Deperdussin Aeroplane Syndicate, Limited, the benefit of the contract "C" specified below, under which Max Graddon and Lawson, Limited, agree to provide at their works at Holloway Road, London, N., all necessary workshop space, machinery, plant, tools, labour and other facilities for the construction of Deperdussin Aeroplanes, which will be carried out by the Company under the superintendence of its own engineers.

Estimated Revenue.

From inquiries made, and from experience gained by the British Deperdussin Aeroplane Syndicate, Ltd., the amount of turnover per annum reasonably to be expected is estimated to be as follows:—

10 Machines, Single-seater 28-50 H.P., at an average price of £740 each	£7,400	
28 2-seater 60-100 H.P., at an average price of £1,050 each	£29,400	
12 3-seater 100-140 H.P., at an average price of £1,600 each	£19,200	
		£56,000
50 Pupils at £75 each	£3,750	
Passenger Flights and Exhibitions	£1,000	
		£4,750
Total Estimated Turnover		£60,750

Estimated Profits.

Estimated gross profits after paying Royalties as hereinafter mentioned on the above turnover		£20,250
Deduct for Rent, Rates, Insurance, Directors' Fees, Salaries of Managing Directors, Technical Adviser, Manager, Aviators, Instructors and Clerical Staff, Advertising, Depreciation, Petrol, Oil and Contingencies, which based on previous experience are estimated to amount to		£6,000
Leaving a Profit of		£14,250
After placing to Reserve Fund	£3,250	
And providing for a 6 per cent. Preferential Dividend	£1,800	
A Dividend of 6 per cent. on the Ordinary Shares	£600	
		£5,650
Leaving available for additional Dividends on the issued Share Capital the sum of		£8,600

Purchase Consideration.

The price to be paid by the Company to The British Deperdussin Aeroplane Syndicate, Limited, of 30, Regent Street, London, S.W. (who are the promoters of the Company), under contract "A" specified below is £11,750, to be satisfied as to £4,750 in cash, and as to £7,000 by the allotment and issue of 7,000 Ordinary Shares of £1 each in the Company, credited as fully paid up. Of such £11,750 the sum of £6,000 is in respect of goodwill. Under the same contract The British Deperdussin Aeroplane Syndicate, Limited, are entitled to an allotment of 3,000 Ordinary Shares of £1 each, credited as fully paid up, as consideration for services in the formation of the Company, and for procuring for the Company the contract "B" specified below.

The price to be paid by the Company to Monsieur Armand Deperdussin, of 26, Avenue de Villiers, Paris, for the patents and rights under contract "B" specified below is £4,000, payable in cash.

Under the same contract Monsieur Deperdussin is entitled to receive as royalty on all Deperdussin machines manufactured by or on behalf of the Company £24 for each single-seater machine with engine under 50 h.p., £40 on each single-seater machine with engine of 50 h.p. and above, and £60 for each machine with two or more seats.

Contracts.

The following Contracts have been entered into:—

A. Contract dated the 12th day of March, 1912, made between The British Deperdussin Aeroplane Syndicate, Limited, of the one part and George Barling Robinson on behalf of the Company of the other part, whereby the Syndicate sells to the Company its business and fully equipped aviation school, and agrees to form the Company and procure for the Company the Contract B specified below for the considerations above mentioned.

B. Contract dated the 15th day of March, 1912, made between Monsieur Armand Deperdussin of the one part and Dominic Lawrence Santoni of the other part for the sale to the Company of the Letters Patent of the United Kingdom Nos. 27,792 of 1910 and 11,139 and 11,697 of 1911, together with the benefit of all improvements thereon, and all further inventions of Monsieur Deperdussin and all patents for the same which may be obtained by or for him in Great Britain and Ireland or any British Colony or Dependency, together with the sole and exclusive right to manufacture and sell Deperdussin Aeroplanes in the United Kingdom and in all British Colonies and Dependencies for the considerations above mentioned.

C. An Agreement dated the 6th day of March, 1912, made between The British Deperdussin Aeroplane Syndicate, Limited, of the one part and Max Graddon and Lawson, Limited, of Mildmay Avenue, Newington Green Road, London, for the provision of manufacturing facilities.

D. Contract dated the 2nd day of April, 1912, made between the Company of the one part, and The British Deperdussin Aeroplane Syndicate, Limited, of the other part, relating to the publication of the Company's Prospectus and procuring subscriptions for 30,000 Preference Shares and the payment by the Company to the said Syndicate of commission at the rate of ten per cent. on the shares subscribed for and allotted on the said prospectus.

E. Contract dated the 2nd day of April, 1912, between the Company of the one part and Dominic Lawrence Santoni of the other part, whereby Mr. D. Lawrence Santoni agrees to act as one of the Managing Directors of the Company for three years at a salary of £500 per annum in addition to fees as an Ordinary Director.

F. Contract dated the 2nd day of April, 1912, between the Company of the one part and Lieutenant John Cyril Porte of the other part, whereby Lieut. J. C. Porte agrees to act as one of the Managing Directors of the Company for three years at a salary of £500 per annum in addition to fees as an Ordinary Director.

Lieut. J. C. Porte and Mr. D. Lawrence Santoni are interested in the promotion of the Company as Directors of The British Deperdussin Aeroplane Syndicate, Limited, and as holders of 876 Shares each thercin.

Estimate of Preliminary Expenses.

The preliminary expenses (that is up to the date of allotment) except commission for placing Shares and brokerage, are estimated to amount to £2,500, and will be paid by the Company.

Brokerage.

A Brokerage of 4½d. per share will be paid by the Company on all allotments made on application forms which bear the name of any broker or authorised agent.

Allotment.

The minimum subscription on which the Company may go to allotment is fixed by the Articles of Association at £100, but the Directors will not proceed to allotment unless in their opinion a sufficient sum is subscribed for the purposes of the Company.

Application will be made in due course to the Committee of the London Stock Exchange for a special settlement.

Directors' Remuneration.

The Articles of Association of the Company contain the following provisions:—

1. The qualification of a Director shall be the holding of 100 Shares in the Company.

The remuneration of Directors shall be £150 per annum each, with an additional £50 per annum to the Chairman, and if any Director holds any salaried office, such as Managing Director or Manager, his remuneration in respect of such other office as aforesaid will be in addition to his fee as an ordinary Director. The Company in General Meeting may vote additional remuneration to all or any of the Directors. All remuneration shall be deemed to accrue day by day. If any of the Directors shall be called upon to perform extra services, or to make any special exertions in going or residing abroad or otherwise for any of the purposes of the Company, the Company shall remunerate the Director or Directors so doing, either by a fixed sum or by a percentage of profits or otherwise as may be determined, and such remuneration may be either in addition to or in substitution for his or their share in the remuneration above provided.

The Directors shall, in addition to their remuneration aforesaid, be paid all travelling and hotel expenses incurred by them respectively on behalf of the Company, including their expenses of travelling to and from Board meetings. A Director may hold any other office or place of profit in the Company, in conjunction with his Directorship, upon such terms as to remuneration, tenure of office, and otherwise, as may be decided by the Directors.

Every member, whether the holder of Preference or Ordinary Shares, has, on a show of hands, one vote only, and on a poll has one vote for each share held by him.

Memorandum of Association.

A copy of the Memorandum with the names, descriptions and addresses of the signatories and the number of shares subscribed for by them respectively, is printed at the end of this Prospectus, of which it forms part.

Copies of the above-mentioned Contracts and of the Memorandum and Articles of the Company may be inspected during business hours, while the subscription list is open, at the offices of the Company.

Application for Shares.

Application for shares should be made on the accompanying form and forwarded to the Company's Bankers with a remittance for the deposit payable on application. Where no allotment is made the deposit will be returned in full, and when the number of shares allotted is less than the number applied for, the balance of the deposit will be applied towards the amount due on allotment, and any balance remaining will be returned. Failure to pay any future instalments on shares allotted when due will render previous payments liable to forfeiture.

Prospectuses and Forms of Application can be obtained at the Offices of the Company and at the Company's Bankers, Solicitors and Brokers.

Dated this 15th day of April, 1912.

Form of Application for Cumulative Participating Preference Shares.

THE BRITISH DEPERDUSSIN AEROPLANE COMPANY, LTD.

(Incorporated under the Companies (Consolidation) Act, 1908.)

CAPITAL - - - £60,000

Divided into 50,000 6 per cent. Cumulative Participating Preference Shares of £1 each and 10,000 Ordinary Shares of £1 each.

*No.*_____

To the Directors of **THE BRITISH DEPERDUSSIN AEROPLANE COMPANY, LIMITED.**

GENTLEMEN,

Having paid to your Bankers the sum of £ : s. being a deposit of 2s. 6d. per Share on application for Cumulative Participating Preference Shares of £1 each in the above Company, I request that you will allot to me that number of such Shares, and I hereby agree to accept the same, or any less number of Cumulative Participating Preference Shares that you may allot to me, upon the terms of the Prospectus of the Company filed with the Registrar of Joint Stock Companies and of the Memorandum and Articles of Association of the Company. And I agree to pay the further instalments due on the Shares allotted to me at the times and as provided by the said Prospectus. And I authorise you to place my name upon the Register of Members in respect of the Cumulative Participating Preference Shares so allotted to me.

Please write distinctly.

*Ordinary Signature*_____

*Name (in full)*_____
(State here whether Mr., Mrs., Miss, or Title.)

*Address (in full)*_____

*Profession or Business*_____ *Date*_____

This Form of Application should be sent ENTIRE, with the deposit of 2/6 per share payable on application, to the BANKERS of the Company, THE LONDON COUNTY & WESTMINSTER BANK, LTD., Covent Garden, London, W.C. Cheques should be made payable to the Bankers, and crossed "not negotiable."

The Week's Work.

A Remarkable Week's Flying—Cross-country Racing at Brooklands—Fine Displays at Hendon—Mr. Valentine's Illness—Good Work at Eastbourne—Mr. Kemp on Windermere—Mr. Sippe at Barrow—Busy Bristol Schools—Mr. Sabelli's Fine Flights—Mr. Cody's Accident—Miss Quimby Flies the Channel—Mr. Grahame-White's Programme.

Easter Monday, April 8th.

Brooklands.—No flying.

Hendon.—One straight flight, and a smash by Mr. Grahame-White, Mr. Lewis Turner, and Carr, as reported last week.

Tuesday, April 9th.

Brooklands.—At Sopwith School, in evening Mr. Raynham out with Mr. Hedley for 25 mins., and Mr. Sopwith alone for short trip in gusty wind, both on Wright.

At Flanders School, Mr. Fisher a circuit, but stopped by plug troubles.

At Bristol School, Mr. Fleming up with Mr. Bettington (new pupil), Mr. Nesham, and Lieut. Mackworth for long solos. Mr. Pixton out on two-seater monoplane for solo, and then with Mr. Lane as passenger. Mr. Fleming with Mr. Mackworth, and Mr. Garne for half hour post-certificate flight.

Eastchurch.—Mr. Frank McClean made fine flight on 70-h.p. Short tractor; wind blowing fully 22 m.p.h. on ground.

Hendon.—Mr. David "Edmund," an Australian pupil, joined W. H. Ewen School. In evening pupils out till dark.

The Plain (Bristol School).—M. Jullerot out testing conditions, but decided to abandon school work.

Wednesday, April 10th.

Brooklands.—At Sopwith School, Mr. Raynham up for half an hour in evening teaching Mr. Hedley, making latter's 22nd flight. Evidently plenty of tuition to be had at Sopwith School.

At Bristol School, Mr. Lane doing straights on monoplane. Mr. Fleming on biplane took up Mrs. Smith and then Miss Smith, mother and sister of Lieut. Smith (ex-pupil). Mr. Nesham for fine high flight alone, and then Mr. Fleming finished work with spiral glide from 1,200 ft.

At Percival School, Mr. Percival brought out rebuilt biplane, now fitted with very powerful warp, and in taking a corner apparently over-warped, so that the machine did a spiral dive from 100 ft. or so, came down on a wing tip, flopped over onto the other side, and broke the plane and chassis on that side. Will soon be out again.

Hendon.—All pupils out at W. H. Ewen School. Messrs. Warren, Dubois, "Edmund," and Lieuts. Pennycuick and Kerrich getting in some good flying and rolling. Mr. Ewen made three flights in evening on little 28-h.p. Deperdussin, being in air over two hours, going across country to Finchley, Harrow, etc.

Mr. Lewis Turner out instructing pupils in the evening, and Mr. Ramsay rolling on monoplane No. 4.

At Blériot School M. Louis Aubert for four straights, M. Pothet two circuits.

Thursday, April 11th.

Brooklands.—At Vickers School, Capt. H. F. Wood and Knight doing straights in early morning.

At Bristol School, Mr. Pixton doing circuits on military two-seater before 7 a.m. In evening Mr. Valentine on other two-seater for a very pretty flight over surrounding country.

At Sopwith School, Mr. Raynham up with Mr. Hedley, the only school work of the day.

Brooklands seems to be getting lazy. Perfect calm and bright clear weather from dawn to 7.45 a.m., but only one pupil turned up at one school, and half a gale blowing rest of day till late in evening.

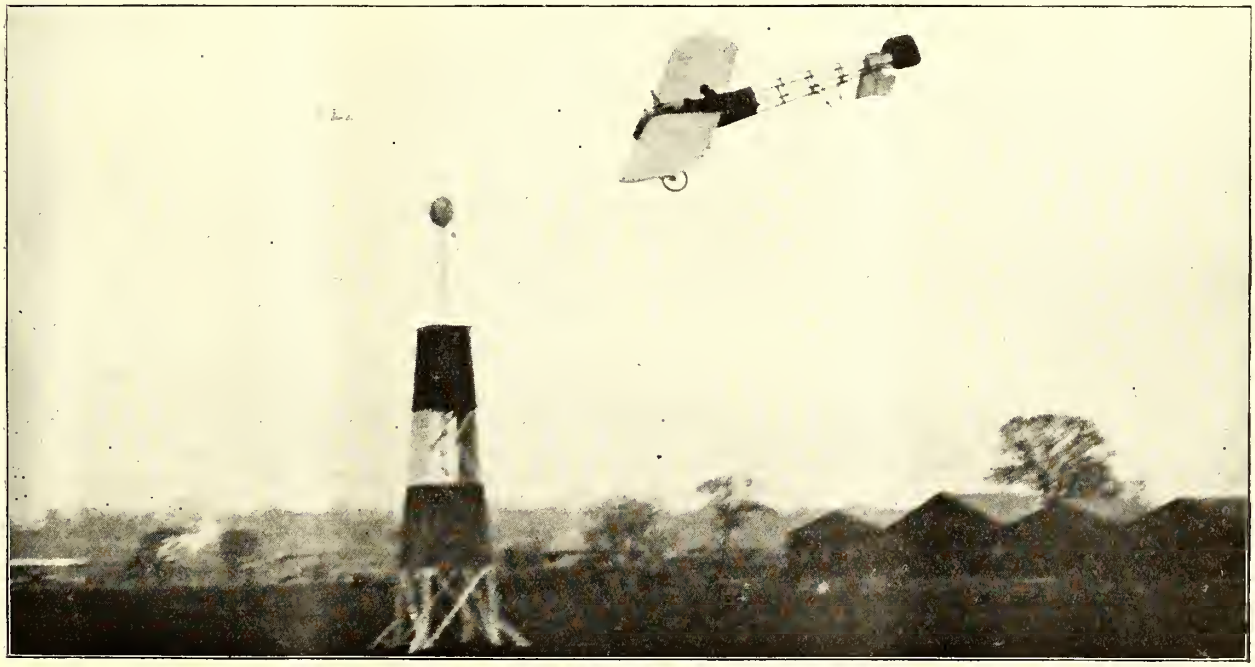
Eastbourne.—Mr. Fowler out testing Blériot-type machine entirely constructed here. Machine flew very well at about 300 ft. for two circuits, landing well.

Hendon.—At W. H. Ewen School, in evening an hour's useful school work put in, Lieuts. Pennycuick and Kerrich each making nice little flights, and Miss Prentice and Messrs. Ware, Gist and "Edmund" showing great improvement in rolling, while Messrs. Dubois, Beaumont and Warren were flying.

At Blériot School Mr. Tremlett three figures of 8, M. Aubert six straights, Mr. Morris seven straights, M. Pothet two circuits, and M. Teulade two straights.

Liverpool (Waterloo).—Parts for repairs to Anzani turned up on 9th, after being stuck on railway for three weeks, and to-day school machine was ready for trial. After tuning it was soon in its old form, but excess of wind prevented flying.

The Plain (Bristol School).—Mr. Gordon England first out giving two trips to Lieut. Saunderson and a naval officer (prospective pupils). Lieut. Head out doing fine things on biplane No. 43, Lieut. Ashton also out on No. 66. Lieut. Antonini circuit on a school monoplane, and M. Jullerot several short trips. Lieut. Ercole rolling on monoplane; Col.



Mr. Gustav Hamel doing one of his magnificent banked turns round a pylon on his Bleriot at Hendon on Saturday last.

THE ONLY SCHOOL WHICH HAS NEVER HAD A SMASH NOR DAMAGED AN AEROPLANE,——

FIRST Established School in England
FIRST to pass an Army Officer for R.Ae.C. Certificate
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FIRST to pass a Pilot in Two Lessons

HEWLETT & BLONDEAU (Brooklands, Weybridge)
A Good Teacher means Safety and Rapidity. **£75** (Inclusive of breakages)

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THE AEROPLANE will be forwarded, post free, to any part of the world at the following rates:—

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12 ,, ,, ,, -	6	6	12 ,, ,, ,, -	11	0

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Should there be any difficulty in procuring THE AEROPLANE from local newsagents, each issue can be obtained direct by forwarding remittance as above.

MORE UNSOLICITED TESTIMONIALS

"The 'Mann' monoplane which I bought recently flew extremely well, and I could not wish for anything better."—Mr. G. C. Davenport, 28, Beechcroft Road, Oxford.

"The workmanship in the 'Mann' monoplane is really excellent."—Mr. Walter V. Jones, 42, Roland Road, Handsworth, Birmingham.

"I received the set of parts this morning, which had been sent off in your usual speedy manner. They are up to your customary splendid standard."—Mr. V. H. Rubin, 20, Sheriff Road, West Hampstead.

"I think your parts excellent, and I am very difficult to please in the workmanship line."—Mr. J. W. Burghope, 14, Wakefield Road, Brighton.

"Your propellers gave wonderful results at the first trial, and must be by far the most efficient on the market."—Mr. R. Leadbeater, 38, Hurlingham Road, S.W.

"I am very pleased with your elastic. My model now flies twice as far as it did before."—Mr. H. de Havilland, "Crux Easton," Newbury, Berks.

"MANN" MONOPLANES, 18s.; Sets of Parts, 7s. 6d.; "Mann" Tractorplanes, 10s. 6d.; Propellers, 3s. 6d. per pair; Lubricant, 1s. 3d. per bottle; Rubber, 1/16-in. square or ⅛-in. strip, 1s. per doz. yds.

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Smeaton also out for practice. Good first trip made by Señor Campaña, pupil landing near Stonehenge, M. Jullerot and Mr. England flying over to him, latter flying back machine with pupil as passenger. Mr. Bendall for circuit, Mr. Gordon England with a passenger. In evening M. Jullerot to Fargo.

Windermere.—Mr. Ronald Kemp arrived to assist Mr. Gnosspelius with hydro-monoplane.

Friday, April 12th.

Brooklands.—At Deperdussin School, Signor Sabelli out for three circuits on racer, and Mr. C. C. Turner rolling on taxi for half hour, showing great improvement.

At Sopwith School, just three hours' flying. Mr. Young passed first half of certificate in morning. Mr. Raynham up several times with Mr. Hedley and alone. Mr. Sopwith took up Mrs. Locke-King and then Mr. Valentine as passengers, later going to Hendon with Mr. Valentine on Bristol and flying back on own Blériot with Mr. Hucks. Mr. Young flew for half an hour and passed second half of certificate. Mr. Hedley also in charge of machine with Mr. Raynham as passenger. Mr. Young is the first pilot to get certificate on new type Wright machine in this country.

At Flanders School, Mr. Fisher in morning did 45 min. non-stop flight, going up to 1,000 ft. several times, testing Bristol propeller with excellent results.

At Bristol School, Mr. Pizey, with mechanic as passenger, over surrounding country at 1,500 ft., making four circles in spiral descent. Later, Mr. Pizey, at 1,000 ft. to 1,200 ft., on 35-h.p. Anzani-engined monoplane, landing with engine stopped from that height. In afternoon, Mr. Valentine, on military two-seater, did straight flight with two passengers as well as himself on board, getting up to 20 ft. or so. Later alone for 15 mins. Mr. Pizey at same time on school Anzani at 500 ft. to 600 ft., doing banked turns and practising glides for 15 mins. Later Mr. Pizey testing biplane reached 1,200 ft. in two circuits. Mr. Nesham, Mr. Lawrence and Mr. Garne all doing solos on other biplane. Mr. Fleming up high with Mr. Nesham. During Mr. Lawrence's flight, connecting rod broke in the Gnôme (which is officially regarded as infallible), but Mr. Lawrence made a perfect landing. Mr. Valentine flew his two-seater to Hendon with Mr. Sopwith as passenger, latter returning on own Blériot with Mr. Hucks as passenger. On return journey alone Mr. Valentine became faint while at 1,000 ft., and landed at Hounslow, leaving machine in charge of police. He intends to take a rest for some weeks, which he certainly needs, as he has not been looking well lately.

In evening, Capt. Allen doing straights on Anzani-Bristol monoplane, and later Mr. Pizey for circuits on same. Mr. Fleming up on biplane to end day's work in darkness.

At Vickers School, Mr. Knight out on No. 2 machine improving in lift.

Eastbourne.—Mr. Victor Yates out on Gnôme Blériot, and made two flights of 10 mins. each at over 800 ft., finishing with fine *vol plané* from 500 ft. Found the wind quite strong and choppy at 500 ft. Mr. Gassler out rolling all day.

School now comprises two Gnôme Blériots, one passenger Blériot, one 28-32-h.p. Anzani-Blériot, and three school machines, so there is every opportunity for pupils. Ground has also had a lot of work done to it, and is now very good indeed. There is a big demand for passenger flights, and the passenger machine should very soon pay for itself.

Hendon.—At W. H. Ewen School very big day's work put in, pupils being out with school machines almost continuously from 5 a.m. to 7 p.m. Ten pupils were on the ground, all of whom got in excellent work without any mishap beyond a broken wire. Miss Prentice is making excellent headway, rolling full extent of the ground in absolutely straight lines, and Messrs. "Edmund," Ware, Gist and Lawford have thoroughly overcome difficulty of keeping the machine in true line. Lieuts. Kerrich and Pennycuick each got in several straights and are showing exceptional aptitude in handling Blériot. Messrs. Baumann, Dubois and Warren each made several nice flights. For benefit of some intending pupils, Mr. Ewen put up several fine exhibition flights on 28-h.p. Duperdussin, doing some fine racing round course and cutting past pylons with beautifully banked turns.

At Grahame-White School Mr. Lewis Turner early out on new biplane No. 5 for test after alterations to ailerons, engine running well but tail low, and after couple of hours' various tests and trials, machine was returned for adjustments, which were quickly effected. Mr. Turner then out again and making another test flight with mechanic as passenger, machine flying much better. Messrs. Manton, Morris, Roupell all out rolling on biplane No. 3, Mr. Hucks at circuits on monoplane No. 6 and biplane No. 3. Mr. Lewis Turner also out on biplane No. 1 for test flight, afterwards with passenger and Mr. Biard making straight flights on same machine, also Mr. Hucks at circuits. Mr. Turner then out on machine No. 3 with a passenger before vacating seat to Mr. Biard, who flew several circuits; Major Liles also on same machine at straights.

At Blériot School Mr. Tremlett four figures of 8, Mr. Thomson eight straights, M. Aubert eight straights, Mr. Hall six straights, Mr. Morris ten straights, M. Pothet one circuit, M. Teulade one straight.

The Plain (Bristol School).—Lieut. Edmunds three good flights, and several figures of eight, showing himself ready for brevêt. Mr. Montague Jennings showed splendid progress in two flights he made, landing being very neat. Lieut. Ercole for short trip on monoplane. Mr. Gordon England up on the tractor biplane for three trips, during which machine showed itself a fine flier, answering controls perfectly and showing good turn of speed. M. Jullerot took Lieut. Grace, of Cavalry School; this officer afterwards up with Mr. Bendall. Two good solos made by Lieut. Hall on biplane No. 43. Mr. C. Howard Pixton sighted on monoplane, flying from Brooklands. Landed splendidly with a spiral *vol plané*, and said he had had an excellent journey. Mr. Gordon England then up on tractor biplane flying for 20 mins. M. Jullerot making half a dozen instructional trips. Towards evening Mr. England had tractor biplane out and landed at Fargo. Mr. Pixton, on biplane No. 55, with mechanic to see what was the matter, afterwards flying back to hangars. M. Jullerot gave flight to Lieut. Styles, and afterwards with Lieut. Grace for a short cross-country, arriving back after three-quarters of an hour. Lieut. Edmunds for a solo on biplane No. 43, and passed brevêt tests, observed by Mr. Cockburn. Only had a week's tuition. Two good solos by Mr. Montague Jennings. Lieut. Antonini up on monoplane. Passenger flight to Lieut. Nicholins by M. Jullerot, and Señor Campaña out on monoplane and descended at Fargo. M. Jullerot flew over to him with Lieut. Ercole, latter flying machine back. Mr. Gordon England gave high flight to Lieut. Edmunds, reaching nearly 1,000 ft. Mr. Bendall a circuit. Lieut. Hall twice on biplane No. 66 and practice on the monoplane. Colonel Smeaton also out two trips on biplane.

Windermere.—Mr. Ronald Kemp out on Mr. Gnosspelius' hydro-monoplane doing good straight flights; developed leak in radiator and put back for repairs.

Barrow-in-Furness.—Mr. Sydney V. Sippe made very successful flight on Avro-Green hydro-aeroplane. Got off in about 100 yards, and rose in three or four circuits of dock to nearly 200 ft. Not very good climbing, but machine is under-powered for weight-lifting, as 35-h.p. engine has to lift, with pilot, 1,000 lbs. on 310 sq. ft. surface, and is hampered by head resistance of floats. Weight is accurate as machine was weighed in airship shed.

Saturday, April 13th.

Brooklands.—At Deperdussin School, Mr. Petre out on No. 4, chassis slightly strained, so no more flying, and unable to enter for race.

At Sopwith School, Mr. Raynham giving instruction to Mr. Hedley, and Mr. Sopwith up alone, Wright machine doing an hour's work before starting in race.

At Flanders School, Mr. Fisher out at midday testing a new propeller, and then with a Régy propeller for 20 mins., at 800 ft. Put Bristol propeller back for race, and did well. After race Mr. Manning doing skims, and Mr. Fisher later up at 500 ft. to 700 ft.

At Vickers School, Capt. Wood and Mr. Knight each doing circuits with new propeller, and machine flying remarkably well. In afternoon after race, Lieut. Beatty getting used to machine, and in evening Capt. Wood doing circuits right out over Byfleet, doing glides from 500 ft.

At Bristol School, Mr. Pizey across country with Lieut. Mackworth, and then later doing figures of 8 at 500 ft. to 600 ft. Later Mr. Valentine to Hounslow by car and flew two-seater back, prior to taking his holiday. In afternoon Mr. Pizey up with Lieuts. Lewis and Bettington. Then up to 1,000 ft. with passenger, doing four circle spiral glide and landing in front of sheds. A fine show for the public. Then out on Anzani-Bristol at 1,000 ft. Afterwards went out and won cross-country race. Later on Lieut. Mackworth up alone on biplane, Mr. Pizey with numerous passengers. Captain Allen practising on monoplane, as also Mr. Lane. Lieut. Bettington making first attempts on monoplane. Mr. Pizey finishing work with fine fancy flying on biplane. Mr. J. R. Duigan on own Avro up for 35 mins. non-stop, doing 15 laps. Good flying for a novice.

During afternoon several pilots arranged a cross-country handicap sweepstakes among themselves. Handicapping excellently done by Mr. Handasyde, for Mr. Pizey on Bristol

biplane won by 1-5 of a second from Mr. Sopwith on his 70-h.p. Blériot, although receiving 4 min. 35 secs. start in six miles. Handicapper calculated Blériot speed at 66 m-p.h., and Bristol speed at 35 m.p.h., with excellent results. Mr. Fisher, on the Flanders (receiving a minute), was a couple of seconds behind Mr. Sopwith, and Mr. Raynham on the Wright was a fraction of a second behind him, the end of the procession being Mr. Spencer, who was a considerable distance behind. In a well-regulated community little cross-country races of this kind would be organised by the governing body of the sport, or by the aerodrome proprietors—as is now being done at Hendon. It is a strange commentary on the progress of aviation in this country that five first-class pilots should be willing to race across country for a prize of £2 10s., subscribed by themselves, without any contribution from the people to whom they are paying very adequate shed-rents, or from the club to which they belong. Incidentally a silver cup was kindly presented to the winner by Mrs. Malcolm, a resident in Byfleet, who takes a very keen interest in aviation.

Hendon.—W. H. Ewen School started work at 5 a.m. with Lieuts. Kerrich and Pennycuick and M. Baumann showing splendid improvement on Blériot. M. Dubois mounted the brevêt Deperdussin for the first time and put in two excellent flights, handling machine with confidence and landing very neatly, after which Mr. W. T. Warren did short flight on same. In evening school machines again out, and Messrs. Lawford, "Edmund," Baumann, Miss Prentice, and Lieut. Kerrich got in good rolling and flying. Mr. Ewen in afternoon across country on the little Deperdussin in great style.

At Blériot School Mr. Tremlett four figures of 8, Mr. Welburn nine straights, Mr. Morris nine straights, M. Aubert eight straights, Mr. Hall four straights, M. Pothet two circuits, M. Teulade six straights. In afternoon Mr. D. Corbett Wilson, the Irish aviator, having brought his new 50-h.p. Gnôme Blériot over from France, did an excellent flight right over Harrow and Ealing at 1,000 ft., this being his first intentional flight in England, as he smashed two school machines in a week before going to Pau for the winter. He is now a really fine flier. Mr. D. L. Allen flew to St. Albans and back, 22 miles in 22 min., circling the Cathedral, and flying in splendid style.

Mr. Gustav Hamel on his Blériot, flying in marvellous style, doing fancy banks round pylons, and playing tricks out in middle of ground to please Messrs. Sassoon and Astley, who apparently were trying experiments in chassis dodging, Mr. Hamel swooping down to within a foot or two of their heads, and then doing sharply banked turns.

At Grahame-White School new Grahame-White biplane No. 5 was put through good day's testing, Mr. Lewis Turner making many flights during morning and afternoon, amongst them being three passenger flights. Mr. Grahame-White also made an exhibition flight on same machine, afterwards taking up passengers. Mr. Hucks out for several flights on monoplane No. 6, proving himself a Blériot flier of the first class, and biplane No. 3. Mr. Gates at circuits on biplanes Nos. 1 and 3 and Mr. Biard also flying circuits on No. 3. Altogether a magnificent afternoon's flying, which was much appreciated by some 3,000 people who were present, and should go far to popularise aviation.

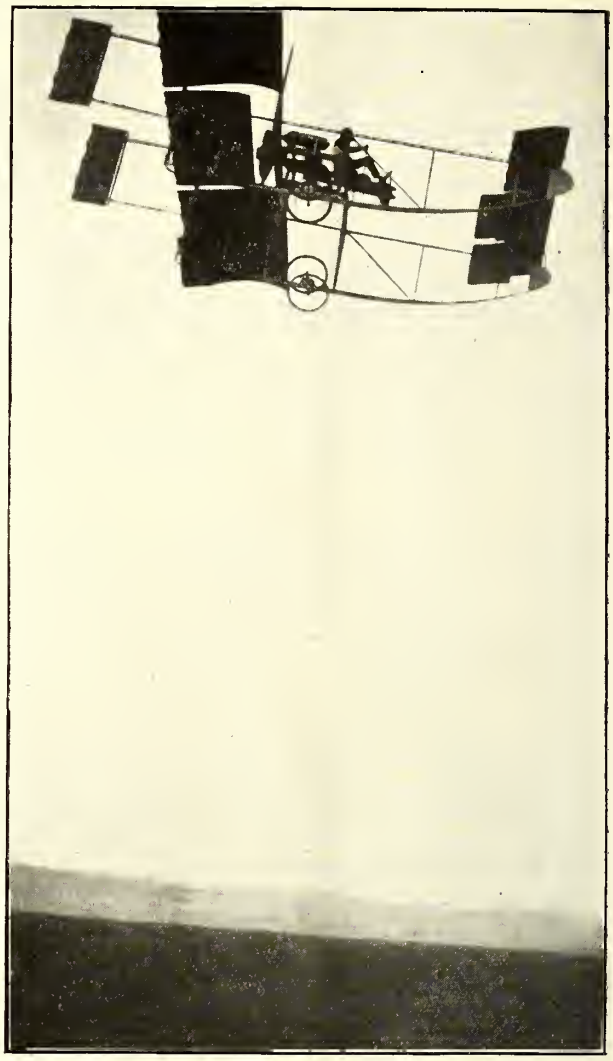
Filey.—Messrs. Brereton, Scott and De Villiers all out, first-named on 50-h.p. Blackburn at good altitude, whilst last two put in long hops, practising landing.

Liverpool (Waterloo).—Mr. Birch took first lesson in engine control, but, probably through shortness of oil, the engine nearly seized up, and operations had to be suspended.

Newcastle-on-Tyne.—Capt. Sanders performed at opening day of "flying week" at Gosforth Park Aerodrome; he first did few straights, and afterwards circular flights. Further details lacking at moment.

The Plain (Bristol School).—Mr. Hotchkiss first out. Four solos by Lieut. Hall with good landings. Lieut. Edmunds out. M. Jullerot took Mr. Montague Jennings for *vol plané* practice, and afterwards with Lieut. Nicholins. Mr. Jennings four good solos. In evening, M. Jullerot, with three prospective pupils, Capt. Grace, Lieut. Saunders, Lieut. Hardee; Mr. Gordon England, with Capt. Grace and Lieut. Ercole. Good work by Lieut. Hall. Mr. Montague Jennings five solos; also Lieut. Edmunds and Señor Campaña. Lieut. Antonini two solos on single-seater monoplane, then for 15 mins. on two-seater. M. Jullerot on double-seater. Lieut. Ashton rolling on school monoplane, and afterwards for two solos on biplane. Lieut. Ercole rolling on monoplane. Five tuition flights by Mr. Bendall on No. 66.

Windermere.—Mr. Ronald Kemp did several nice three-mile straight flights, getting off with and against the wind. Reports Mr. Gnosspelius' hydro-monoplane as being fast (between 50 and 60 m.p.h.) and likes behaviour of floats. Machine now to have fuselage covered in, and whole thing properly tuned up.



Mr. Barber making a farewell flight on the Valkyrie racer at Hendon just before Easter.

Sunday, April 14th.

Brooklands.—At Deperdussin School, Signor Sabelli out in rising wind in morning, but brought down by engine trouble.

At Vickers School, Lieut. Beatty did first circuits since taking brevêt last May, flying in fine form at 500 ft. or so for quarter of an hour. Mr. Knight also up at 400 ft. for 20 mins., and then Mr. Beatty up again. Long absence of machine from air has been due to complete overhaul of every detail since certain accidents on other machines has shown need for investigation of unexplained troubles.

At Bristol School, Mr. Pizey up with Lieuts. Bettington and Lewis giving tuition at 500 ft. to 600 ft. Then Captain Allen did two excellent circuits on monoplane, handing over to Mr. Bettington, who did straights and finished by getting 20 ft. into air and landing on the propeller. Surprisingly little damage done considering position. Rudder bar smashed, showing that pupil was standing on it when he struck. Chassis carried away, but wings unhurt. Afterwards Mr. Pizey up with pupils. In afternoon Mr. Pizey carrying many passengers. Captain Weeding, Mr. Lawrence, and Mr. Garne all doing post-certificate flights and all flying very well.

Afternoon made interesting by another impromptu race organised by aviators themselves. Mr. Sopwith (owed 5 min. 18 secs.) from scratch, flying his Blériot and carrying Mrs.

Lane as passenger. won by a few seconds from Mr. Fisher (owed 4 min. 26 secs.) on the Flanders, with Mr. Pizey (on limit) carrying Mr. Garne as passenger, on the newer Bristol biplane, third. Mr. Raynham (owed 3 min. 4 secs.) was close up, and Mr. Lawrence (owed 30 secs) a long way behind.

The course was to Chertsey Bridge and back, round the sheds, out again round the grain warehouse at Addlestone, and back to Brooklands, about nine miles. The event caused quite an amount of excitement among the little crowd present, all five competitors being close together at the end of the first lap. The way Mr. Sopwith and Mr. Raynham took the corner round the sheds was absolutely paralysing to watch, and must have been highly educative to many of those who saw it. A cup was presented for the race by Mr. Sopwith's sister, Mrs. Raikes, and her friend Mrs. Lane, who proceeded to go out and win it herself as passenger with Mr. Sopwith.

Earlier in the afternoon, Signor Sabelli had made a magnificent flight of 75 minutes on the little 35-h.p. Deperdussin, rising to 1,300 ft., and flying at about 1,000 nearly all the time. He and the little "Dep" are now quite one of the features of Brooklands. Lieut. Chinnery and Mr. Petre were also flying well on Deperdussins.

Lieut. Beatty, R.E., was doing circuits in capital style on the big Vickers. Mr. Spencer was flying the revised MacFie biplane. Mr. Hedley, flying the Sopwith School Wright alone, landed, switched on, bounced up to 20 ft. and pancaked flat, breaking two main spars and two uprights. Very small damage considering length of drop.

Dover.—Mr. Hamel did a couple of flights at Dover aerodrome on Blériot. First time, after one or two circuits, he had to come down owing to Gnôme mis-firing. Second flight was splendid, ending with fine banked turn into the ground with engine shut off.—(H.)

Filey.—Conditions good, and Filey people saw some of the finest flying in Yorkshire. Mr. Brereton flew the 50-h.p. magnificently for half an hour, performing evolutions of crack flier at 800 ft. Messrs. Scott and De Villiers making long, steady flights at good altitude, and landing well in spite of scattered groups of spectators. [When will people learn to keep clear of machines?—Ed.]

Hendon.—At W. H. Ewen School, Lieut. Kerrich and MM. Baumann and Dubois out at 5.30 a.m. getting in good practice. In evening M. Baumann made a very nice flight on Blériot; Lieuts. Pennycuick and Kerrich getting in some excellent straights; Miss Prentice and Messrs. "Edmund," Lawford and Gist all handling the Blériot confidently and showing marked progress.

At Grahame-White School splendid flying and a full day's work put in by Messrs. Grahame-White, Lewis Turner and B. C. Hucks. Mr. Grahame-White making exhibition flights on the new bipane, No. 5, and also on his 70-h.p. Nieuport. Mr. Lewis Turner out on biplane No. 5, making over a dozen flights during the day and taking up nine passengers. Mr. Hucks busy at circuits on monoplane No. 6; Mr. Lewis Turner concluding day's work by circuits on the old school 'bus. More excellent education for the crowd. Evidently the Hendon people intend to succeed in their task of stirring up enthusiasm.

The Plain (Bristol School).—M. Jullerot and Mr. England out testing. At 3 p.m., Lieut. Burney as passenger with M. Jullerot. Mr. Gordon England also out. Later, Mr. Pixton took up Captain Grace and Lieut. Saunders; M. Jullerot took Lieut. Wall of Cavalry School. At 6 p.m. wind dropped and Mr. England brought out tractor biplane, and made good flight. M. Jullerot out on two-seater for half an hour. Mr. Pixton made fine flight on tractor biplane, being his first flight on this machine. Mr. Pixton made several circuits with sharp hankings. Lieut. Antonini then three circuits in two-seater monoplane. Mr. Bendall flying with Capt. Grace and Mr. Fraser.

Mr. Cody's Accident.

The accident to Mr. Cody on Monday was, as usual, considerably exaggerated by the daily papers. Mr. Cody and Lieut. Fletcher were flying over Laffan's Plain when, about 500 yards from the sheds, the steering went wrong and the rudders refused to come back after being pulled round. Mr. Fletcher was driving, but Mr. Cody switched off the engine and the machine came down on one wing and pitched them both out. Apparently Mr. Cody, as he was thrown out, knocked the switch on again; the engine started, and the machine flew another 300 yards by itself and almost fell into the Basingstoke Canal.

Mr. Fletcher escaped with a few bruises, but Mr. Cody was rather badly knocked about, so he was taken home in a motor car, and on Tuesday morning was reported as being very much better.

Mr. Frank Cody, while hurrying home on a bicycle to tell his mother of the accident, ran over a dog and was thrown on to his face. He was carried home unconscious just before his father arrived, and he is much the more seriously injured of the two. Mr. Cody hopes to be about again in the course of a few days. The machine did not hit a tree, and Mr. Cody was not thrown across the canal.

The First Woman to Fly the Channel.

On Tuesday morning, the 16th inst., the Channel was flown for the first time by a woman when Miss Harriet Quimby, a New York journalist, who learned to fly at the Moisant School, crossed from Dover to Calais on a Blériot. She has been flying in America for some months, as readers of The Aeroplane know, and her daring, or recklessness, may be gauged by the fact that she used habitually to fly up to 2,000 ft. without knowing how to glide, and it never seemed to occur to her that she might have difficulty if her engine stopped. An English aviator who saw her first attempt at a glide told the writer that she started it at 1,000 ft., and practically "pancaked" the whole way down in spasms. However, her performance on Tuesday stamps her as a woman of unusual initiative, determination, and ability, and she deserves every congratulation. It is apposite that the Blériot should have the credit of carrying the first man, the first woman, the first two men, and the first man and woman across the Channel. Will it also carry the first two women?

Cross-Country Work at Liverpool.

On the 3rd inst. Mr. Melly had the Blériot two-seater out, and, taking Mr. Hardman with him, flew to Freshfield to call on Planes, Ltd., but found them all away. There must have been a bigger wind high up than was apparent near the ground, as the distance of nine miles took 17 mins. on the outward journey and only 7 mins. on the return. The average height attained was 800 ft. The flying was easy, and the machine gave every satisfaction on this its first cross-country flight since the break-up at Manchester last autumn.

Flying at Eastchurch.

Messrs. Short Bros. have recently turned out a new 100-h.p. tractor biplane for naval work. She was put through her trials just prior to the Easter holidays by Commander Samson, R.N., and was highly successful, having remarkable climbing and gliding powers. As is usual with all Short machines, she is built exceptionally strong, and was not intended particularly for speed, although she shows about 60 miles per hour.

During the Easter holidays Mr. Frank McClean was out on the Saturday and Sunday on the 70-h.p. Short tractor in a strong wind, and Professor Huntington succeeded in getting off with his automatic stability machine, making several straight flights and reaching an altitude of about 30 ft.

A Northern Success.

The writer recently had the opportunity of seeing some photographs of the successful monoplane recently produced by Planes, Ltd., of Birkenhead. This machine has already been flown some 500 miles by Mr. R. C. Fenwick at Freshfield with an Isaacson engine, so that it has been proved a practicable vehicle. The present machine is purely experimental, and the firm have some excellent improvements in hand.

The writer is not at liberty to give any details at present, but ventures to direct the attention of military aviators to the machine on account of the fact that though it has the engine in front it gives a perfectly clear field of fire in front of the pilot, and through something like 300 degrees round him. Also it gives excellent facilities for observation. In fact, it is a machine whose development is very well worth while following, as it appears to the writer one of the most promising at present under construction.

Lady Motorists and Aviation.

On April 2, at Claridge's Hotel, Mr. B. H. Barrington-Kennett, Grenadier Guards, lectured before the Ladies' Automobile Club on the subject of aviation. He impressed on his audience the necessity of parents withdrawing their unreasoning opposition to their sons' desire to take up aviation as a profession.

A New Blériot Pilot.

Mr. Lucien Tremlett, who has been flying consistently well at the Blériot School at Hendon, won his certificate in excellent style about 6 a.m. on Tuesday last.

Memorandum on Naval and Military Aviation.

"The following memorandum shows further details of the scheme of naval and military aviation which, in the debate on Army Estimates, on the 4th instant, Colonel Seely informed the House of Commons had been adopted by the Government, on the recommendation of the Committee which, under his chairmanship, had been commissioned to consider and report on the whole subject.

"This memorandum omits all reference to the important subjects of emoluments and similar financial considerations, in regard to which the details have not been finally decided.

"War Office, April 11th, 1912.

Considerations of General Policy.

"The Government have been impressed by the evidence which has been placed before them regarding the state of Aerial Navigation in this country, compared with the progress made by other great naval and military Powers.

"The necessity for an efficient aeronautical service in this country is not less urgent than in the case of the other Powers. The efficiency of the aeroplane for purposes of military reconnaissance has been proved both in foreign manœuvres and in actual warfare in Tripoli, and without doubt aeroplanes have now become an important adjunct to the equipment of an army in the field.

"The strategical and tactical uses of the aeroplane as an adjunct to the operations of a fleet cannot yet be forecasted with equal certainty, but it is clear that this country cannot afford to incur the risk of dropping behind other nations in this matter, and that every facility must be given for experiment and progress.

"There are admittedly advantages in a policy of postponing the development of aeroplanes for naval and military purposes, and of leaving the pioneer work to private enterprise and to foreign nations, but it is clear that aeroplanes have now to a great extent passed out of the experimental stage as regards their employment in warfare, and an active and progressive policy has therefore become imperatively urgent.

General Principles.

In formulating the policy to be adopted the Government have been guided by the following principles:—

"(*a*) The organisation adopted should provide establishments adequate for our present requirements, but must be sufficiently elastic to permit of considerable expansion in the future.

"(*b*) The organisation should be capable of absorbing and utilising the whole of the aeronautical resources of the country.

"(*c*) While it is admitted that the needs of the Navy and Army differ, and that each requires technical development peculiar to sea and land warfare respectively, the foundation of the requirements of each service is identical, viz., an adequate number of efficient flying men. Hence, though each service requires an establishment suitable to its own special needs, the aerial branch of one service should be regarded as a reserve to the aerial branch of the other. Thus in a purely naval war the whole of the Royal Flying Corps should be available for the Navy, and in a purely land war the whole corps should be available for the Army.

"(*d*) It is important to give every possible encouragement to the development of private enterprise in aviation, and every inducement should be offered to flying men who do not belong to the Navy and Army to join the Royal Flying Corps. Proposals in this respect, and with regard to encouragement for existing aerodromes, will be found in this paper.

"(*e*) It is essential that all combatant officers in the Royal Flying Corps should be practical flying men.

"(*f*) Experimental work in all branches of the Royal Flying Corps should be co-ordinated."

Outlines of the Scheme.

The general outlines of the scheme proposed by the Government are as follows:—

"The British aeronautical service is to be regarded as one, and by special permission of his Majesty the King is to be designated 'The Royal Flying Corps.'

"The Royal Flying Corps will supply the necessary personnel for a Naval and a Military Wing, to be maintained at the expense of, and to be administered by, the Admiralty and the War Office respectively. The corps will also provide the necessary personnel for a Central Flying School, and for a reserve on as large a scale as may be found possible.

"This school is to be established for the training of flying men on Salisbury Plain, being maintained at the joint expense of the Admiralty and War Office, and being administered by the War Office. After graduating at the Flying School, flying men will become members of the Royal Flying Corps, and will then be detailed to join either the Naval Flying School at Eastchurch for a special course of naval aviation or one of the Military Aeroplane Squadrons for a special course of military aviation, or to pass into the Reserve of the Royal Flying Corps.

"The Naval Wing of the Royal Flying Corps, entry to which should ultimately only be obtainable by qualifying at the Central Flying School, will for the present have its headquarters at the Naval Flying School at Eastchurch. It is impossible to forecast what its ultimate organisation and development will be, as this depends to a great extent upon the result of experiments, which are about to be commenced, with hydro-aeroplanes.

"The Military Wing of the Royal Flying Corps should consist of a number of squadrons, entry to which should ultimately be confined to those who have qualified at the Central Flying School. Eight of these squadrons are required for use in connection with the Expeditionary Force. Seven of these will be aeroplane squadrons, the eighth consisting of airships and kites.

"It is desirable that at present no establishment should be fixed for the Royal Flying Corps as a whole, but only for the Naval and Military Wings, and these provisionally with a view to future expansion. The Royal Flying Corps will be largely composed of officers and men who are not performing continuous service, and who are merely incurring an obligation and being retained on condition that they keep themselves proficient. Many of them will probably be naval and military officers performing duty with their ships or regiments, and many others will have joined on conditions of service resembling those of the Special Reserve of the Army.

"The mechanical requirements of the Royal Flying Corps will be provided by the existing Army Aircraft Factory, which, with his Majesty's permission, is being renamed the 'Royal Aircraft Factory.' This establishment should undertake the following important duties:—The higher training of mechanics for the Royal Flying Corps and for the Central Flying School; the reconstruction of aeroplanes; repair work for the Royal Flying Corps; tests with British and foreign engines and aeroplanes of the latest design, and experimental work.

"The Aeronautical Advisory Committee will continue its experimental and research work on the present lines, and it is of great importance that there should be the closest possible collaboration between the Naval and Military Wings, the Central Flying School, the Royal Aircraft Factory, and the Advisory Committee. An officer from the Central Flying School and an officer from the Naval and Military Wings respectively should be added to the Advisory Committee.

"The Government attach importance to the maintenance of private enterprise in the field of aeronautics in this country. The objects of this are not only to provide a reserve of flying men which may be drawn on in emergency, to stimulate invention and to keep alive public interest, but also to provide aerodromes, landing places and sheds at convenient intervals throughout the country, without which cross-country flights are almost impossible. Accordingly it is proposed that (*a*) for the present military officers and civilians who are candidates for commissions in the Royal Flying Corps should first have to obtain their Royal Aero Club certificate, and on being accepted as members of the Royal Flying Corps should receive the sum of £75, and (*b*) a small rent should be paid to the principal aerodromes for landing rights and for the use of sheds by members of the Royal Flying Corps engaged in cross-country flights. The French Government rightly attach importance to cross-country flights, and offer every encouragement to those engaged in military aviation to undertake such flights.

"The Government propose that a permanent consultative Committee should be appointed, to which questions in connection with flying affecting both departments should be referred by the Admiralty and War Office. This Committee should be designated the 'Air Committee,' and should be a permanent Sub-Committee of the Committee of Imperial Defence, and should be composed of representatives of the various departments concerned.

The Royal Flying Corps.

"In dealing with the formation of the Royal Flying Corps

and its reserve, some difficulty arises from the consideration that the requirements of wastage in war in this new arm are unknown quantities. No estimates can be made of first-line requirements which are not to some extent guess work. Hence it follows that the Reserve of the Royal Flying Corps should be as large as financial considerations will permit, and should be capable of expansion in case of emergency—capable, indeed, of absorbing the whole of the resources of the country in this branch of science.

Conditions of Service.

"Entry to the Royal Flying Corps as officers will ultimately be confined to those who have graduated at the Central Flying School. Those officers will be drawn from (*a*) officers of all branches of the naval and military services, and (*b*) civilians. The rank and file will consist of warrant officers, petty officers, non-commissioned officers and men transferred from the Royal Navy or the Army, and also of men enlisted directly into the Royal Flying Corps, either on a regular or a special reserve basis.

"Officers of the Navy who are selected for service with the Royal Flying Corps will, as a rule, undergo their elementary training at the Central Flying School. Officers of the Army may, when selected, be required to obtain the Royal Aero Club certificate, by private arrangement, before joining the Central Flying School. After graduating at the Central Flying School, officers will be attached, as may be necessary, to the Naval or Military Wing for further training. At the conclusion of their training they should be eligible to be appointed either (*a*) for continuous service in the Naval or Military Wing of the Royal Flying Corps, or (*b*) to the permanent staff of the Flying School, or (*c*) to the Royal Flying Corps Reserve.

"The period of appointment in the case of officers who elect for continuous service with the Naval or Military Wings of the Royal Flying Corps or at the Central Flying School will normally be four years.

"Civilian candidates for appointment to the Royal Flying Corps as officers will apply in the first instance to the Commandant of the Central Flying School, quoting the number of their Royal Aero Club certificate.

"Men transferred from the Navy and Army, or enlisted from civilian sources, for continuous service should be selected by the naval or military authorities respectively, and by the Commandant of the Central Flying School. The period of enlistment suggested is four years, with re-engagement from year to year, or opportunity to transfer to the Reserve.

"Great importance is attached to the primary condition that every member of the Royal Flying Corps shall incur a definite obligation to serve in time of war either for naval or military purposes in any part of the world.

"The Royal Flying Corps, with the exception of the Naval Wing and officers and men of the Royal Navy and Royal Marines who are members of the Reserve of the Royal Flying Corps, will be under the administration of the War Office.

Conditions of Reserve Service.

"The officers of the Reserve of the Royal Flying Corps should be divided into two classes; the officers of the First Reserve should be required to produce on the first day of each quarter satisfactory evidence that they have performed during the previous quarter flights amounting to an aggregate of nine hours in the air, and including one cross-country flight of not less than one hour's duration. These conditions should be subject to modification in particular cases. Flyers of the Second Reserve need not be required to carry out any flights, but should be available for service in the Royal Flying Corps in time of war.

"Flyers of the First Reserve should be given facilities for their obligatory flights every quarter at one of the naval or military establishments, or, if this is impossible, at a private aerodrome. An authorised rate of payment should be laid down for flights undertaken at private aerodromes.

"No aeroplanes should be purchased for the Reserve of the Royal Flying Corps at the present stage, though this should not prejudice future policy on this question. For the present the Reserve should provide personnel rather than matériel.

"A reserve, however, of matériel would be required in war, and for this purpose the Commandant of the Central Flying School should keep a register of privately owned aeroplanes, which might usefully be purchased for the use of the Royal Flying Corps in case of emergency.

"Members of the Royal Flying Corps who own aeroplanes should be encouraged to bring these to the Central Flying School, when they undergo their training there, and to naval and military manœuvres.

"The Government believe that a considerable proportion of the qualified flying men in this country can be attracted to this Reserve, which will then be of real value, being available in any part of the world and for either service.

"It is not proposed at present to fix any limit to the numbers to be entered, as the number of qualified flying men in the country is comparatively small, and it is unlikely that as many as 100 applications will be received in the first year. Later on it will probably become necessary to fix a definite establishment of the Reserve of the Royal Flying Corps.

The Central Flying School.

"The Central Flying School should be established on Salisbury Plain, on ground south-east of Upavon, the contract for the purchase of which has been signed. This ground must be regarded essentially as a flying ground. It should only be used for the training of troops in so far as that training interferes in no way with the work of the Central Flying School.

"The site has been inspected twice by a committee of experts in order to view it under varying conditions. They reported as follows:—

"'This area is in every way suitable for the proposed purpose. It is better than any British aviation ground with which the members of the Committee are acquainted.

"'A certain amount of ground is at present under plough, but there is nothing to prevent the formation of an excellent surface for rolling over very large tracts.'

"Apart from its excellence as a flying ground, however, the site selected presents the following advantages:—

"It is situated in a lonely spot several miles from a railway station, and is therefore not liable to the inconvenience and danger of attracting large crowds of spectators.

"The nature of the surrounding country is such that good landing places are available over a very wide area.

"A good road runs through the centre of the aerodrome, affording all necessary transport facilities.

"The presence of large numbers of troops undergoing training on Salisbury Plain offers facilities for preliminary training in military reconnaissance.

"It is conveniently situated with regard to the existing aerodromes at Aldershot, etc., for the commencement of cross-country flights, and is not too far distant from the sea at Portsmouth and Portland.

Courses of Instruction.

"There should be three courses at the Central Flying School during the year, each course to last four months, which is considered to include a sufficient margin of time for leave of absence and spells of bad weather.

"There appears to be no reason to suppose that one season of the year is less favourable than another for training in flying. It is possible that in summer there are more days during some part of which flying is possible. In winter, on the other hand, there are apt to be more days during the whole of which it is possible to fly.

"The training to be carried out should include (i) progressive instruction in the art of flying, (ii) instruction in the general principles of mechanics and the construction of engines and aeroplanes, (iii) instruction in meteorology, (iv) training in observation from the air, (v) instruction in navigation and flying by compass, (vi) training in cross-country flights, (vii) photography from aircraft, (viii) signalling by all methods, (ix) instruction in types of warships of all nations.

"The naval and military flying establishments should undertake the more advanced training in observation and the transmission of intelligence.

"The sooner the Staff for the Flying School is selected the better, for as soon as possible the members should be formed into a Committee to draw up the syllabus for the first course of instruction for submission to the War Office.

"It is estimated that the number of flyers required for the Navy is forty a year.

"To provide the war establishment for the seven Aeroplane Squadrons that are considered necessary for our Expeditionary Force, 182 officer flyers and 182 non-commissioned officer flyers are required. This will entail passing through the Central Flying School one-quarter of this total number annually, if it is assumed that under present conditions a flyer can hardly be expected to remain at active aeroplane work for more than four years.

"If, in excess of actual Naval and Military requirements, a margin is allowed of, say, 25 per cent. for pupils undergoing instruction who fail to obtain certificates of proficiency either through sustaining injuries or through loss of nerve, the total service requirements as regards the annual intake of pupils at the school are as follows:—

One-quarter military war establishment of flyers	91
Royal Navy, say	40
	131
Add 25 per cent.	33
Total	164

"In addition it appears desirable to allow for the entry of (say) fifteen civilians during the course of the year, or five for each course of instruction.

"Hence the total number to be passed through the Central Flying School in each year will be:—

To maintain the naval and military establishments	164
Civilians	15
Total	179

"Thus, having regard to the foregoing considerations, it would appear necessary to estimate that for the immediate future accommodation should be provided for sixty pupils at the Central Flying School in each term. As these numbers are liable to be increased, when the requirements of the Army other than those of the Expeditionary Force are decided, the school should be readily capable of expansion.

"Steps have already been taken for the purchase of twenty-five aeroplanes for the Central Flying School, and deliveries will commence as from April 30th, 1912. The makers have been called upon to meet all necessary requirements.

"Experience has shown that buildings of a permanent nature are very much more satisfactory, and ultimately more economical, than temporary buildings. Moreover, temporary huts are not well suited to the climatic conditions of Salisbury Plain.

"Having regard, however, to the fact that the Central Flying School may require large expansion in the near future, and more especially that temporary buildings can be erected far more rapidly than permanent ones, all buildings, including sheds, should at first be of a temporary nature, without prejudice to the construction of more permanent buildings in the future.

"All plans and specifications are now ready, and tenders have been invited for the erection of temporary barracks, sheds, workshops, and a small hospital, at an estimated cost of approximately £25,000.

Transport.

"It will be necessary that complete war transport for two flights of aeroplanes should be provided at once for the Central Flying School.

General.

"The Instructional Staff will require a few weeks in which to assemble, tune up, test, and accustom themselves to the new aeroplanes, but it may confidently be expected that the first course will be completed before the close of 1912.

The Naval Wing of the Royal Flying Corps.

Provisional Organisation.

"The Naval Wing of the Royal Flying Corps will be established for the present at the Naval Flying School at Eastchurch. For the immediate future its energies will be devoted mainly to elementary training in flying, so as to provide a nucleus of flyers for the first requirements of the Navy, pending the establishment of the Central Flying School, and to experimental work in the development of aeronautics for the Navy.

"In a short time the preliminary training in flying will be undertaken entirely by the Central Flying School, and the Naval Flying School will then be utilised for experimental work, and for the specialised training of naval ranks and ratings and of selected civilians in naval air work.

"It is impossible to over-estimate the importance of experiments for the development of hydro-aeroplanes, and in flying from and alighting on board ship, and in the water under varying weather conditions. Until such experiments have proved conclusively how far such operations are practicable, it is impossible to forecast what the rôle of aeroplanes will be in naval warfare, or to elaborate any permanent organisation. The present organisation must therefore be regarded as provisional.

"The Naval Flying School at Eastchurch will, for administrative purposes only, be provisionally under the orders of the captain of H.M. ship *Actæon*, and all officers and men will be borne on the books of the *Actæon*.

"Steps have been taken for the purchase of twelve aeroplanes, hydro-aeroplanes and floats for first requirements.

"In selecting the types for purchase it has been deemed desirable to test a number of types with a view to arriving at the most suitable pattern for naval service. As soon as a satisfactory type of aeroplane for future use has been evolved, orders will be given so as to ensure that there are always not less than two machines of the same type available.

"The prospects of the successful employment of the rigid type of airship are not sufficiently favourable to justify the great cost, and it is therefore recommended that the naval experiments should be confined to the development of aeroplanes and hydro-aeroplanes. The utmost vigilance will be taken, however, in watching foreign developments of the airship, and the present recommendation will not be taken to prejudice a reopening of the question, should important developments occur.

The Military Wing of the Royal Flying Corps.

General Principles of Organisation.

"At present no military requirements beyond those of the Expeditionary Force, which are of urgent importance, are being dealt with. It must be borne in mind, however, that considerable extension will be necessary in order to provide for the requirements of those military forces which are not included in the Expeditionary Force.

"For the future the Military Wing of the Royal Flying Corps should comprise all branches of aeronautics, including aeroplanes, airships, and kites. All these are required for the same purpose, and should work in close co-operation.

"The present Air Battalion, R.E., ceases to exist under this scheme. Its personnel and matériel should be absorbed as far as required in the Royal Flying Corps.

"The purposes for which aeroplanes will be required in land warfare are as follows:—(*a*) Reconnaissance, (*b*) prevention of enemy's reconnaissance, (*c*) inter-communication, (*d*) observation of artillery fire, (*e*) infliction of damage on the enemy.

"Having considered the organisation of the aeronautical forces of other Powers, so far as information is available, the Establishments laid down below would appear to provide a suitable organisation for the Expeditionary Force of six divisions and one cavalry division, viz.:—Headquarters; seven Aeroplane Squadrons, each providing twelve aeroplanes; one Airship and Kite Squadron, providing two airships and two flights of kites; one Line of Communication Flying Corps Workshop.

"The Administration of the Military Wing will be carried out by the War Office.

Flyers, &c., Required for Seven Aeroplane Squadrons.

"Up to the present time the authorities have only attempted to train officers as flyers. It is now proposed to train non-commissioned officers and men as well.

"It is considered that the minimum number of trained flyers should be two per aeroplane. Of these one should be an officer, and in the case of one-seated machines both should be officers.

"For purposes of calculation, however, one officer and one non-commissioned officer flyer are allowed.

"The number of flyers required on this basis is shown in the table below:—

	Seven Squadrons. Officers.	Non-commissioned Officers.
Commanders	7	0
Sergeants	0	7
Three Sections	84	84
Total	91	91

"In addition, it is necessary to provide a reserve to meet casualties, and it is considered that this should be on a basis of 100 per cent. for six months' wastage.

"The total number of flyers required will therefore be:—Officers, 182; non-commissioned officers, 182.

"In addition to flyers, the necessary mechanics should be provided for the maintenance of machines, etc.

Peace Establishments.

"The first requisite is to provide the trained personnel for the formation of the *war* establishment of the flying service.

"Eventually it may be possible to draw up a more economical *peace* establishment, when the Reserve of the Royal Flying Corps has been developed sufficiently to enable the Military Wing to count on an effective organised reserve.

Distribution of the Aeroplane Squadrons.

"N.C.O.'s and air mechanics (the term 'air mechanic' is applied to denote men of the Royal Flying Corps below the rank of petty officer or sergeant) will be required as engine drivers, fitters, carpenters, smiths, sailmakers, riggers, etc. Selected N.C.O.'s and air mechanics should also be trained as flyers. To provide this personnel, it will probably be necessary to rely largely on direct enlistment, except, perhaps, as regards flyers.

"The period recommended is four years. On completion of the period of continuous service re-engagement should be allowed from year to year, or transfer to the Reserve of the Royal Flying Corps on the recommendation of the Commanding Officer of the Military Wing, or the Commandant of the Central Flying School.

Commissioned officers joining the Royal Flying Corps should be seconded, and other ranks should be transferred.

Aeroplanes.

"The total number of aeroplanes required for the seven squadrons of the military division will be 84. The completion of these squadrons, however, and the training of flyers for them at the Central Flying School must occupy some considerable time.

Sheds.

"A shed of a portable type, suitable for service in the field, should be at once provided for each aeroplane as it is ordered. Permanent sheds should be provided at the headquarters of squadrons, when the locations have been fixed.

The Use of Airships for Military Purposes.

"Careful consideration has been given to the question of whether airships should still be used for military purposes.

"The airship possesses the great advantage over the aeroplane in military warfare of being able to receive messages by wireless telegraphy; it is also able to transmit to greater distances.

"Other countries can establish permanent sheds or shelters at convenient intervals throughout the country, where the airships can seek refuge in bad weather, and they are therefore able to make better use of dirigibles than this country, whose Expeditionary Force is more likely to be employed oversea. It is hoped, however, that means will be found for overcoming difficulties in this respect, and experiments in this direction are now being conducted, which give prospects of success.

"On a general review of the foregoing considerations it has been decided that any immediate extension of the existing equipment of airships is unnecessary so far as the requirements of the Expeditionary Force are concerned, and the military requirements other than those of the Expeditionary Force are not in question. Having regard, however, to the persistence of all the great Continental nations in experiments with this type of aircraft, it would be undesirable for the Army to abandon entirely the use of airships.

"Therefore the present Airship Company, furnishing two airships, together with the kite equipment, should be retained, and should become an eighth squadron of the Royal Flying Corps.

"Kites form at present the only means of aerial observation in really high winds. Two flights of kites should therefore be included in the Airship Squadron of the Royal Flying Corps.

Transport.

"War transport will be required for each flight on its establishment.

The Royal Aircraft Factory.

Functions.

"The existing Army Aircraft Factory has been renamed the 'Royal Aircraft Factory.' It will be administered by the War Office. It should carry out the following functions:—(1) The higher training of mechanics for the Royal Flying Corps, (2) repairs and reconstruction for the Royal Flying Corps, (3) tests with British and foreign engines and aeroplanes, (4) experimental work, (5) the existing work in the manufacture of hydrogen and generally meeting the requirements of the Airship and Kite Squadron, (6) general maintenance of the factory as at present.

British and Foreign Engines.

"It is important that this country should keep abreast of all practical developments in the aeroplane industry in all parts of the world. At the present time the primary need of this industry is the perfection of an entirely satisfactory engine. There are at the present time a number of aeroplane engines in the market which are believed to have given satisfactory results. It is extremely difficult, however, especially in the case of foreign engines, to obtain reliable information regarding them without purchasing power. Experience has shown that the foreign engine manufacturer attaches but little importance to the prospect of business in this country, and when approached, either personally or by letter, is prone to be suspicious of a desire on our part to learn by his experience. Fifteen makers of engines are being approached.

The Aerodrome, South Farnborough.

"Certain improvements are required in the aerodrome, South Farnborough. At present there is one good flying ground at Cove Common, where the Royal Aircraft Factory is situated, and another on Laffan's Plain, and to make it possible to alight anywhere between these areas a passage has been cleared. It is very desirable, however, that another passage should be cleared in order to bring the area at Ball Hill into communication with the other two and to allow of a circular flight over the combined areas.

Miscellaneous.

The Use of Private Aerodromes for Cross-Country Flying.

"Great importance is attached to cross-country flights as an essential part of the training of a naval or military airman. If such flights are to be accomplished, however, it is indispensable that landing rights should be obtained at convenient intervals throughout Great Britain, and that shelter should be available whenever practicable.

"The aerodromes at present existing happen to be very well situated for cross-country flying, and, with a few intermediate points, it would be possible to fly regularly and with fair safety from London to Scotland.

"Negotiations have been opened with the managers of these aerodromes, excepting Eastchurch, where the Naval Flying School provides all necessary facilities, to ascertain whether they would be prepared to grant to his Majesty's Government the occasional use of one shed, together with landing rights, for Government aeroplanes, the flyers of which might desire to make use of such facilities during practice flights, etc., and, if so, upon what terms, observing that the shed would only be required occasionally, so that all that would be necessary would be the grant of lien upon it.

The negotiations will be continued by the War Office, one of the conditions which will be fulfilled being the maintenance of stocks of petrol and oil above a certain specified minimum.

"In order further to facilitate cross-country flying, further landing rights will be obtained by the War Office at certain selected points.

"Most of these points would also be of considerable importance for naval or coast defence reconnaissance, and there can be little doubt that at many of them aerodromes must be established at some time for naval or military purposes.

"It is hoped that in time further extensions of this system may be made, so that flying rights may be established over the whole country.

The Encouragement of Private Enterprise.

"Mention has already been made of the fact that importance is attached to the existence in this country of a flourishing private industry. This consideration has been given due weight to in the provisions regarding the purchase of aeroplanes, about half of which will be ordered from British firms. The arrangement under which officers and civilians desiring to enter the Royal Flying Corps as flyers will first have to obtain their Royal Aero Club certificate privately, and the rent to be paid for sheds and landing rights should render some assistance to the private aerodromes.

"A stimulus will thus be provided to private enterprise, which may assist the aerial industry to tide over the difficult initial period.

Meteorology.

"Steps should be taken forthwith for the investigation of the atmosphere above this country. It is important, if the art of aviation is to progress and accidents are to be avoided, that the prevailing air currents and the meteorological conditions of the atmosphere should be studied.

"Evidence by Dr. W. N. Shaw, Director of the Meteorological Office, has been taken on this question. Dr. Shaw laid stress on the importance of co-ordinating the theoretical and scientific experiments with the practical experience of flying men.

"It is plain that little investigation has hitherto been undertaken in respect to those meteorological problems which more particularly concern flying men. Dr. Shaw indicated that he was prepared to conduct such experiments if the necessary funds were placed at his disposal.

"A Meteorological Section should be established at the Central Flying School. Ultimately it may be found possible to include in this section officers who have been compelled to give up actual flying. For the immediate present, however, it will be sufficient to attach a meteorological expert to the Central Flying School for instructional purposes.

"All officers at the Central Flying School should be instructed in meteorology.

"All members of the Royal Flying Corps should be directed to report any unusual meteorological phenomena to the Meteorological Office.

"Each Wing or Squadron of the Royal Flying Corps, as well as the Flying School, should keep a meteorological log, and forward a monthly report to the Meteorological Office.

The German Aeroplane Show.

General View of the Show. On the left is the Deutsche Flugzeug Werke Biplane.

Germany has shown how much in earnest she is about aviation by holding a really important show of aeroplanes in Berlin during the past week. Some twenty-four machines were shown, and most of them show considerable thought, even if the execution of the ideas is not above reproach.

The Aeroplane is indebted to Mr. Howard T. Wright, manager of the Aviation Department of the Coventry Ordnance Co., Ltd., for the following concise account of the show. Mr. Wright says that the leading features of the show are the almost universal use of steel structurally; the fact that in almost all machines the rudders, elevators, and ailerons are warped instead of being hinged; the use of deep girder structures under the wings of monoplanes, in the fashion of the Etrich; the fitting of huge sprags on the tail skids, for use as brakes on landing; and the fitting of propellers which are curved backwards to their plane of revolution, that is to say, the boss is in front to the blade-tips.

Mr. Wright is of the opinion that if half of the machines shown manage to fly, the percentage of fatalities to German aviators will increase enormously, owing to the fact that, in spite of the girder designs and steel structure, the attachments and fittings are so bad.

The following are the chief machines shown:—

The Direktor is a weird monoplane with two engines arranged tandem fashion, and water cooled. These drive two propellers on one shaft, one propeller being chain driven and geared down, while the other is direct driven. The machine is of enormous size, weighing 1,400 kilogrammes and having girders 6 ft. deep, and badly built, under the wings, yet it is only about 15 ft. long fore and aft.

The Euler firm show two biplanes and a triplane. They are practically Farmans, but with steel chassis, and two wheels instead of four. They are fitted with Stahlherz engines, which are exact copies of the Gnôme. One of these machines is a baby biplane with a monoplane tail. The triplane has a 4-ft. chord and a 3-ft. gap, and all three have a decidedly primitive appearance.

The Albatros is, as it was at the Paris Show, a very fine piece of work, a tractor biplane with struts arranged diagonally instead of vertically; the chassis is now of steel. The wings, as formerly, are on the Etrich lines.

The Haefelin is a weird monoplane with a fuselage built of steel tubes, the longitudinals starting from the chassis, and these being wound round with a kind of corkscrew of smaller tube, so that no stay-wires are used. The whole is fabric cased. The engine is a German copy of a 50-h.p. Anzani.

The Goedecker is also a monoplane with girder-trussed wings. It has a huge elevator and very small rudders, and a chassis something like a Bristol monoplane without the skids. The main spars are of steel tube, with bamboo ribs in pockets in the single surfaced planes.

The Grade monoplane is shown in two types. The familiar single-seater on the lines of an enlarged *Demoiselle*, and two with fuselages. One of these has an 8-cylinder and the other a 4-cylinder engine, both of V type, air-cooled, and turned upside down. The fuselages are of steel tube, held together by a corkscrew of light tubing, and are shaped like an onion with a long tail. The pilot sits in the fuselage, which is cased in. The chassis is of Nieuport type, with a central skid mounted on springs. All controls are warped.

Gustave Otto shows a monoplane of the Nieuport type, but with two skids and two wheels—Sommer fashion. He fits a 4-cylinder water-cooled engine.

The Bayrische works show a strange contraption in which

the tail is carried on a 3-inch steel tube. This tube is split where it reaches the wings, and in the fork are carried the tanks and a German imitation of the Gnôme engine. Below the wings is the body-work, cased in and containing two seats, and dual control, arranged tandem fashion.

Emil Jeannin, once a Farman pilot, shows a monoplane on Nieuport lines, but the chassis has two leaf springs, one behind the other, and there are no skids. The tail, which is all empennage and elevator, is about 8 ft. long. At the back of the chassis, where the Nieuport skid touches the ground, is a steel support shaped like a foot, which supports the fuselage when standing.

The Harlan people show a monoplane with a four-wheel chassis like a Farman. The wings have three main spars, and are very well stayed underneath. The fuselage is cased round the pilot's seat, and is then left open like a Blériot.

The Flugwerke firm show a copy of a Maurice Farman biplane with staggered planes.

The Deutsche Flugzeug Werke show a tractor biplane which really deserves to be called a double monoplane, in that it has no upright struts, the upper plane being supported by a *cabane*. The two planes are connected by immense wire cables. The whole machine is covered with a blue-gray fabric, which looks very smart. The engine is a 4-cylinder water-cooled, completely encased, with *louvres* in the bonnet and the radiator behind the engine inside the fuselage. The chassis has a single axle with four wheels on it, and the chassis struts are of steel tubes about 5 in. by 2½ in. The wings are of Etrich form, and the whole machine is about the best built and best designed in the show.

The Dorner is a two-seater monoplane *a la* de Pischoff, with the engine in front under a motor-car bonnet, and the pilot and passenger behind, all underneath the wings. A shaft runs below the seat and drives the propeller by a chain. A good plan, but for the low centre of gravity.

The Rumpler "Taube," or pigeon, is really an Etrich, but it has been altered by fitting an egg-shaped body like that of the "Portly Piggott." It has a chassis like a bad attempt at an imitation of the Blériot.

The German Wright firm exhibit the original Wright flown by Mr. Orville Wright when he first visited Berlin, the type with two front elevators and no tail. By contrast they show the new type, which has a side-by-side cased-in seat which looks like a sofa. The machine is built all of steel, and has a single chain-driven propeller, between tail-booms, like a Farman. To take this propeller the chassis is built almost as high as that of a Farman. The gap between the planes is very small. By way of novelty a supplementary chain drives a little dynamo which lights a search-light on the machine.

The Luft Verkehrs has a monoplane which looks like a Nieuport gone wrong. The transverse wheel spring is a wooden bar. A clever telescopic wire-strainer is shown.

Fritz Huth shows a monoplane built all of metal. The planes are sheet steel with stiffening strips of T section steel about 6 in. deep, instead of ribs.

The Aviatik is exactly like the old Hanriot, and is similar to the one shown at the Paris Show.

Altogether Germany is making progress, albeit along strange paths.

Hendon's Year.

Mr. Grahame-White and the other directors of the Grahame-White Aviation Company, Ltd., have evidently made up their mind that the London Aerodrome at Hendon is to be *the* aerodrome for regular flying during the coming year, for a programme has been prepared which, if only the weather permits of its being properly carried out, should provide splendid flying every week-end during the summer. Now that public interest in aviation is increasing so rapidly, there should be no difficulty in obtaining really good attendances at these meetings, for, although the weather was absolutely against good flying during Easter, there is no doubt that most of the people who visited the London Aerodrome on the Friday, Saturday, and Sunday were very well satisfied with what they saw, and it is certain that the flying to be seen in future will be much greater in quantity than was seen on those days.

Below is the programme as at present mapped out, and it is to be hoped that readers of The Aeroplane will impress on their friends the fact that it is worth their while to go to Hendon, not only on the days when big meetings are specially advertised, but on any day of the week when it is reasonably calm. Several new firms are taking sheds at Hendon shortly, among them being the Aircraft Company, of which Mr. Holt Thomas is the moving spirit, and the Grahame-White, Blériot, and Ewen-cum-Deperdussin-cum-Caudron Schools are all expanding rapidly, so that even on ordinary days, when nothing but school work is in progress, there will be plenty of flying to be seen.

The programme is as follows:—

Flying exhibitions and passenger flights are given daily, Sundays included, throughout the season, by Mr. Claude Grahame-White and the leading aviators at the London Aerodrome, Hendon. Contests and race meetings are held each week.

The following dates have already been fixed:—

Saturday, April 20th, First Spring Meeting.
Sunday, April 21st, exhibition flying.
Saturday, April 27th, Second Spring Meeting.
Sunday, April 28th, exhibition flying.
Saturday, May 4th, May Meeting.
Saturday, May 25th, Second London Aviation Meeting (three days).
Saturday, June 8th, Aerial Derby for *Daily Mail* Trophy.
Saturday, July 6th, July Meeting.

The following meetings are being arranged, and the dates will be announced later:—

Military Aviation Display.—Women's Day, open to all lady aviators of all countries.—Illuminated Night Flying.—Theatrical Day.—All-British Race Meeting.—Point-to-Point Race.—Territorial Day.—Empire Day Aviation Display.—Civil Service day.—Anglo-French Meeting Day.

Access to the Aerodrome is easy by rail, tram, or motor 'bus, and the prices of admission are low, being 6d., 1s., or 2s. 6d., according to the enclosure, though an excellent view of the flying may be had from all the enclosures.

To add to the permanent attractions at Hendon, a very fine club-house is about to be erected for the use of members and season-ticket holders. For the first thousand members the subscription is quite ridiculously small, considering that members will have full use of dining-rooms, lounges, recreation-rooms, tennis-courts, and admission to the various enclosures of the aerodrome at all times. In fact, it is the intention of the proprietors to run the club very much on the lines of the Country Clubs which are so popular in America, though the idea has never been properly developed in this country. It is hoped that everyone who is really interested in aviation will support the club by becoming members, for the more members there are the better value that can be given to each individual.

The Spring Meeting on Saturday next includes four events—a speed handicap, a cross-country handicap to a point about ten miles out and back, a figure-of-eight speed contest, and an altitude contest—for all of which handsome cups, accompanied by cash prizes, will be given. Among the entrants up to date are such well-known fliers as Messrs. T. O. M. Sopwith, Gustav Hamel, James Valentine, Henri Salmet, B. C. Hucks, and Lewis Turner, and to these will probably be added Mrs. Stocks, Messrs. Ewen, Allen, and others, so that, given fine weather, a really good afternoon's sport may be expected.

Wireless Telegraphy at the Aircraft Factory.

The question of fitting aircraft with wireless telegraphy is of increasing interest as year by year machines become more reliable. The problem has been to design apparatus which will conform to the limitations of weight and provide an efficient aerial system for transmission and reception. Marconi's Wireless Telegraph Co. have of late given considerable attention to this problem, and some time ago conducted important experiments on the Flanders monoplane.

The field of the more recent experiments has been the Army Aircraft Factory at Farnborough. Late in March an Army aeroplane went out for a short flight fitted with a clockwork sender, and from it good signals were received. Early in April similar experiments were carried out, but in these Capt. George Dawes, of the Berkshire Regiment, went as a passenger and transmitted his observations to the receiving station at the Factory. The messages which he sent were very clearly received, and later the machine flew over an area of about three to four miles' radius from the Aircraft Factory, and Capt. Dawes was able to report on the movement of troops manœuvring in the vicinity. These reports, which would have been of the utmost military value, were taken down at the receiving station, which was in touch with the aeroplane during the whole of the flight. On the third circuit Capt. Dawes himself received the messages which the Marconi operator transmitted from the aeroplane.

The Gilmour Memorial Fund.

The Gilmour Memorial Fund continues to make highly satisfactory progress, as may be seen from the amount noted as being subscribed this week. Mrs. Handasyde has collected during the past week at Brooklands the large sum of £32 5s., and several donations have been received from friends of the late Mr. Gilmour in Somersetshire.

It will be necessary before long to close the fund, and therefore it is hoped that those who intend to send subscriptions, but have so far been delayed from doing so, will hand them in as soon as possible either to Mr. Harold Perrin, Secretary of the Royal Aero Club; Mr. T. O'B. Hubbard, Secretary of the Aeronautical Society; Mr. T. W. Staplee Firth (who is Mr. Gilmour's executor), c/o Firth and Co., 77, Chancery Lane, W.C.; Mr. Harry DelaCombe, Royal Aero Club; or to Mr. Eric Clift, 51, Sinclair Road, S.W., or to C. G. Grey, at this office.

	£	s.	d.
Amount already acknowledged :—	133	9	0
H. F. Locke King; A. and G. E.—£5 each (2) ...	10	0	0
James Valentine	3	3	0
T. Maryon Wilson; Farnell Thurston (£2 2s. each (2)	4	4	0
Vivian Hewitt; W. Holt Thomas; Henry Jullerot —£1 1s. each (3)	3	3	0
R. Twining; R. C. Baker—£1 each (2) ...	2	0	0
Eric Gardiner; Charles C. Turner; J. G. Ronald; C. M.; Mrs. D. M. André; F. G. Wigley—10s. each (6)	3	0	0
N. S. (entered in error as 1s. 6d. instead of 10s.) add 8s. 6d.		8	6
C. H. Iplesden; A. Collyer; R. V. Finlay; M. C. H. Moens; R. H. Cobb; F. P. Armstrong; C. Webb; E. D. Jones; A. M. B. Brooks; C. Thomson; Krascewski; Miss McAlister; Miss Harriet Trask—5s. each (13) ...	3	5	0
S. S.		3	6
H. Morriss; Eric Horniman; Laurie Davies; M. K.; A. G. Taylor; Horace Purcell; P. W. Holden; F. M. B.; R. N. White; W. F. C.; G. H.; A. L. M.; W. Head; C D. L. Hill; Master Trevor Trask—2s. 6d. each (15) ...	1	17	0
G. Rawson; W. A. Wasley; G. V. T.; J. H. Cruden; F. W. R.; H. W. Fox; Miss Ethel Marsh—2s. each (7)		14	0
O. T. Jones; E. G. Jones; E. J. Lopjo; W. B. Spooner; G. Hadden; N. Phillips; J. Tatler; W. J. Lovell; V. Aster; N. Daniel; G. Drummond; W. H. S.; C. C. Grierson; G. C. J.; F. C.; T. L. P.; H. L. R.; R. B.; C. B.; A. W. E.; L. L. P.—1s. each (21)	1	1	0
W. Lobb; E. C. A.; A. H.; G. K. M.; C. D. Roberts; N. L. Swift; Ridley; F. Mann; J. F. Baryman; A. R. Kent; H. M. Webb; L. B.; S. T.; S. L.—6d. each (14)		7	0
	£166	15	6

The Aeronautical Society.

Meetings will be held at the Royal United Service Institution on Monday, April 29th, at 6.30 p.m. Chairman, Dr. W. N. Shaw, F.R.S. Captain C. H. Ley on "Aerial Topography." On Thursday, May 16th, at 8.30 p.m., F. H. Bramwell on "National Physical Laboratory Research."

A series of three papers on military and naval subjects will be delivered at the R.U.S.I. on the following Wednesdays, May 29th, June 12th, and June 26th.

Informal meetings for the discussion of set subjects are held at the Society's Offices, 11, Adam Street, Adelphi, on Mondays, from 5 p.m. The following subjects are down for discussion :—April 22nd, "Blériot's Report on Monoplanes"; May 6th, "Atmospherical Conditions at the Hendon Aerodrome"; May 13th, "Double-engined Aeroplanes."

Major-General R. M. Ruck has been elected Chairman of the Council for 1912.

The following have been elected members of the Society: H. D. Carey, Sir George Greenhill, F.R.S., J. L. Hodgson, B.Sc., A.M.I.C.E.

The Most Hon. the Marquess of Tullibardine has accepted the invitation of the Council to become a Vice-President of the Society.

Students attending regular science, engineering, or aeronautical courses at recognised technical colleges, as well as those pursuing the scientific side of aeronautics professionally, are eligible for the Students' Section

The A.S.L. Sale.

The whole stock of machines and parts of the Aeronautical Syndicate, Limited, has been purchased by the enterprising Mr. Handley Page, who has thus saved the trade from the humiliating spectacle of a sale by auction of the assets of a British firm which could make successful flying machines. Incidentally, several people who reckoned on getting bargains at the auction have been disappointed, though they may possibly buy the same things cheaply from Mr. Handley Page, especially as that astute gentleman has succeeded in selling two of the machines *in situ*, which must have considerably reduced any expenses he expected to incur in handling the stock.

CLUB NOTICES.

Birmingham Aero Club.—Contest at Coventry abandoned owing to gale. Splendid flying at Billesley Farm last week. Messrs. E. Trykle, G. Haddon Wood, G. Wilde, M. Vale, W. Lunn, H. J. McManus, G. Baker, G. Baxter, W. A. King, J. E. Overton, N. Stamps flying.—G. Haddon Wood, Joint Hon. Sec., 8, Frederick Road, Edgbaston.

Dover and District Model Aero Club.—Competitions again postponed owing to crack flyers being unable to attend. Best flights made by C. Sargeant, R. Wilson, H. D. Davis and Whorwells. Will McCall please come down to "Oakville," Godwyne Road, Dover (any evening), as secretary has mislaid his address? Postponed competitions held on Saturday at 2.45 p.m. on Northfall Meadow.—H. D. Davis, Hon. Sec.

Bristol Model Flying.—Meeting, April 13th. Flights by Messrs. Howse (described in error last week as Moore), Keyte, and others. Next meeting April 27th at Sea Walls at 3 p.m., when prize for "rising from ground" may be competed for. Weight to exceed 6 oz.—R. V. Tivy, Hon. Sec., 3, Royal York Crescent, Clifton.

Manchester Model Aero Club.—First meeting, Saturday, 20th, 2.30 p.m., for cash prizes to 10s. The competition decided by formula—total weight multiplied by distance divided by weight of rudder. Models complete to weigh not more than 4 oz. nor less than 3 oz. Mr. W. H. Booth has offered two prizes of 10s. 6d. for duration and distance flown by model embodying the Redivalls patent. Mr. Booth will explain details on aerodrome on Saturday. The competition open during season.—Kenmure Kinna and Alan F. Jones, Hon. Secs., 40, Bignor Street, Cheetham.

Ealing and District Aero Club.—On Saturday good flying by Messrs. C. Davies, A. Houlberg, C. Chilcott, G. Beeching, D. Chown, and G. Pearson. On Sunday L. Kirchner testing. Average flights about 500 ft. Contest with Aero Models' Association (N. Branch) arranged for next Saturday, 20th, at Park Royal, 3.30 p.m., for duration. Contest with Blackheath Ae. Club being arranged for June 12th (subject to alteration). Flying next Saturday at Greenford.—B. J. Kirchner, Hon. Sec., 1, Queen's Gardens, Ealing, W.

Stony Stratford and District Kite and Model Aeroplane Club.—Members' competitions postponed from April 6th will be held on May 4th. Competitors to be at Judges' Flag at 2.30 p.m.—O. Hamilton, Junr., Hon. Sec.

Blackheath Aero Club.—Grove Park, Saturday, Messrs. Brown, Morris, Pizey, Egelstaff and Woollard flying. Blackheath—Messrs. J. H. Dollittle and Hunt flying. Grove Park, Sunday, Messrs. Bailey, Dollittle and Pizey flying.—A. E. Woollard, Hon. Sec., 48, Hafton Road, Catford, S.E.

Paddington and District Aero Club (1910).—Last Saturday, Kite and Model Aeroplane Association held trials on club's ground. Mr. H. Weston broke duration record with 64 sec., and Mr. Rowlands distance record with 1,280 ft., less deduction for wind. Mr. Dollittle, of Blackheath Aero Club, made a flight of over 60 secs., as also did Mr. Cannell. Mr. H. Weston flew new single-propeller 4 ft. monoplane. Next Saturday, postponed point-to-point competition, and in evening Mr. W. Evans will give demonstration at workshop in making carved propellers. On Saturday, April 27th, Mr. V. E. Johnson, M.A., will show his steam plant at club workshop. New members elected—Messrs. F. W. Johnson and S. J. Whybrow.—W. E. Evans, Hon. Sec., 133, Buchanan Gardens, College Park, Harlesden.

Hackney and District Aero Club.—At display of models at Spensly Hall, Friday last, there were shown a triple screw monoplane by P. Gittus, Mr. Longstaffe's steam-driven "Demoiselle" of 7 ft. span, and full-sized propeller by Mr. Taplin. On Saturday, Messrs. Taplin, Gittus, Marmin, Field, Burton, Lewin, Hill, and Longstaffe all flying well. Annual subscription now reduced to 3s.—B. W. Longstaffe, Hon. Sec., 47, Jenner Road, N.

MISCELLANEOUS ADVERTISEMENTS

All Advertisements for this column should arrive at this office by 6 p.m. Monday, to ensure insertion.

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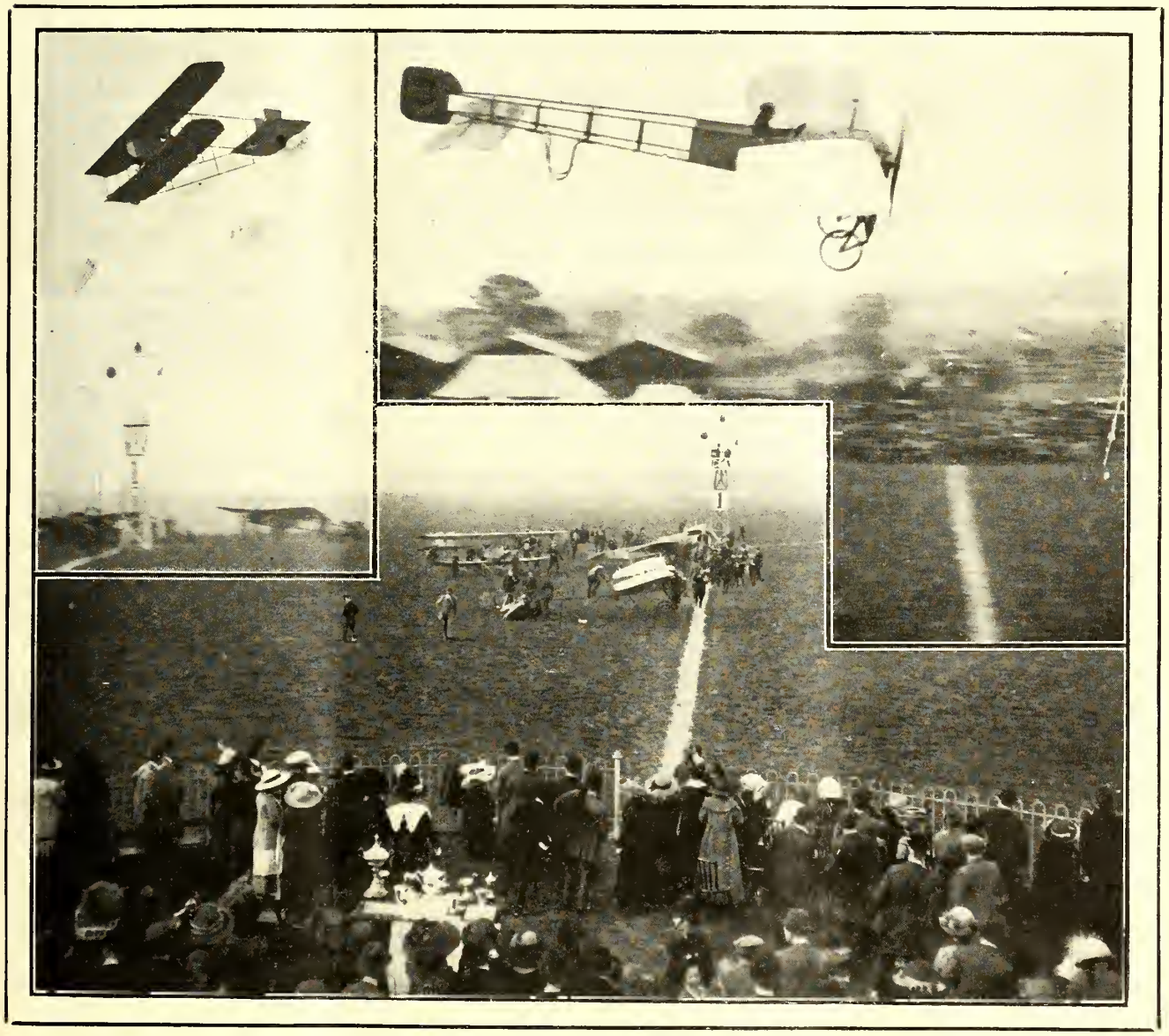
THE LONDON AERODROME'S FIRST SPRING MEETING.



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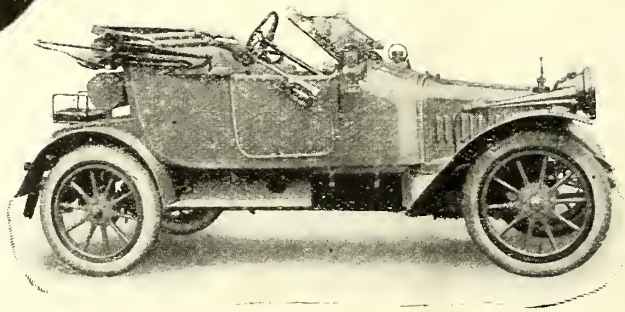

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MATTERS OF MOMENT.

CIVILIANS AND THE ROYAL FLYING CORPS.

The announcement is made that, on the evening of Tuesday, April 30th, Colonel Seely, the Under-Secretary of State for War, will receive at the House of Commons any aviators who wish to accept the invitation of the Royal Aero Club to be present at the reception, as well as any other members of the R.Ae.C. who wish to attend and who signify their desire to do so to the Secretary of the club, Mr. Harold Perrin.

Though the idea of a Cabinet Minister condescending to interview in bulk a number of civilians whose services may be desired in time of war will probably upset the cherished illusions of a lifetime for many Service men, the idea has, nevertheless, much to recommend it. Colonel Seely may be accused of turning recruiting sergeant and of sacrificing the dignity of his office in an attempt to acquire a reputation as the founder of Great Britain's aerial supremacy—when we achieve it—but personally the writer is inclined to regard the idea as a very shrewd piece of business on the part of a singularly open-minded Minister, who is quite well aware of his own comparative ignorance on the subject of aviation and who is anxious to get the views of the men who know more about it.

Of course, the great trouble will be that he will not get the views which are really worth having, because the men who know most, and whose opinions are best worth having, are immediately stricken dumb if bidden to get on their legs and talk.

There is, as a matter of fact, a considerable difficulty in the employment of civilians in the Royal Flying Corps—namely, the social positions of the aviators themselves. Flying is supposed to be a rich man's game, but if careful enquiry is made into the social position of those civilians who hold aviator's certificates it will probably be found that only a proportion of them could, in fairness to themselves, be taken into the Royal Flying Corps as commissioned officers, even in the Reserve. True, the Territorials and Special Reserve have accustomed one to a certain type of officer, who, though perhaps highly efficient in his way, would feel somewhat of a fish out of water in the officers' mess of a Regular regiment; but quite a number of aviators who would be highly desirable as school instructors or as pilots of observer-carrying machines in time of war are, owing to their unfortunate selection of parents, still less suited to commissioned rank. At the same time, their education and general ability would make it equally unpleasant for them and unfair to them if they were relegated to the barrack-room, or even to the sergeants' mess.

This may appear to many as mere snobbishness, but, nevertheless, it is a fact which has got to be faced. In France things are different. Where a nation has been thoroughly democratised by universal military service it is possible for a Latham to serve for a week or two as a sapper-reservist alongside a Védrines; but so long as the relics of the feudal system exist in this country one cannot expect the very able pilot Bill Smith, with a county school and technical institute education, to be quite happy after his day's work is done over Salisbury Plain if his only society is the product of the public schools and Sandhurst, the "Shop," or even the universities, unless, of course, there are enough men of his own class to form a separate little clique, which would be bad for all concerned; and if put into the non-commissioned ranks he would feel equally isolated from the type evolved by the board school and barrack yard.

It really looks as if it would be better to engage civilian aviators purely as pilots, and let them have a rank and mess of their own, rather than to attempt to divide them on some purely arbitrary principle into commissioned and non-commissioned officer Reservists. After a certain amount of work in this particular grade an aviator who wished to join the Service permanently might be given a commission purely on his merits, or might be enlisted into the ranks, starting as a non-commissioned officer; but for a beginning the rank of pilot-aviator in the Royal Flying Corps should be sufficient honour.

Another somewhat difficult matter of which to make absolutely certain is whether those who join as Reservists really intend to turn out in case of war. The writer has painful recollections of a certain Militia regiment which, at the time of the South African War, volunteered for active service to a man, all except its colonel. As a result, when the regiment returned, the officers' mess consisted of the colonel and his unfortunate adjutant, who could not get out of being present at mess. There are certainly men who join Special Reserve, Yeomanry, and Territorial battalions purely from vanity, and there are likewise men who fly for vanity's sake; and the prospect of being referred to in the daily Press as an "Army airman" and having a military rank to put on a probably gilt-edged visiting-card at the same time would be very tempting to such men. Therefore, one would like to suggest that conditions of service in the Royal Flying Corps Reserve should be made as arduous as possible, so as to weed out at once all aviators but those who are in deadly earnest and who mean to see the thing through.

Man's conquest of the air is real war, and war, as General Sherman said, is Hell. The two national

Services have now taken on that war, and though aerodrome flying will go on as a sport, just as rifle-shooting is a sport, the real thing is going to be fought out at the Central Flying School and in the cross-country flying organised there. The country is going to find the money and the men, but the man who is not game for real war had better stop at home.

Questions in the House.

Royal Flying Corps.

Mr. Sandys asked whether the construction of the sheds and buildings at the new aviation school has been begun, and when it is expected that the Royal Flying Corps will be able to commence work on the new ground?

Colonel Seely: Work has been commenced upon the buildings of the Central Flying School. The date upon which the school will be opened cannot yet be stated.

Mr. Sandys asked whether, before the purchase of the Upavon estate for an aviation school, the opinion of any practical aviation officers was obtained as to the suitability of the property; whether, in view of the fact that a large portion of the estate is totally unsuited for aviation purposes, the whole of the purchase-money of the estate will be paid out of the Aviation Vote; and who was the owner of the land from whom the purchase was made?

Colonel Seely: The ground was originally selected on the unanimous recommendation of a committee of which an expert flying officer was a member. The ground was again inspected by Brig.-General Henderson, Mr. Mervyn O'Gorman, and Lieut. Gregory, R.N., on behalf of the Sub-Committee of the Committee of Imperial Defence, of which I was Chairman. They reported very favourably on the suitability of the ground for flying purposes; their report will be found on page 5 of Command Paper 6067, recently laid on the Table. The land is being bought out of Vote 10. The owners of the land, from whom the purchase was made, were Mr. E. B. Maton, St. Katherine's Hospital and the Ecclesiastical Commissioners.

Mr. Sandys asked how many officers of the Royal Flying Corps are now engaged upon aviation work, and how many aeroplanes suitable for military purposes are at present in the possession of the War Department?

Colonel Seely: At present there are twenty-four officers employed in airship and aeroplane work. Sixteen aeroplanes are at present in possession of the War Department.

[It may be interesting to note that the Army possesses of modern Bristol and Nieuport monoplanes, one each; of obsolescent Blériots, Deperdussins, and Bréguets, one each; and the rest are altogether obsolete. The Navy possesses a really modern Deperdussin monoplane, a Short tractor biplane, and a Short monoplane. The rest are obsolete. The Army has six officers only who are experienced fliers. The Navy has five experienced fliers. The rest are either mere beginners or else balloonists. It would therefore be interesting to know whether Colonel Seely was referring to the Royal Flying Corps as a whole or to the Army wing only, and how his figures were produced.—Ed.]

Mr. Sandys asked whether it is intended that aviation officers shall take part in the manœuvres this year; and, if so, how many officers and machines it is expected will be available?

Colonel Seely: It is intended that detachments of the Royal Flying Corps should take part this year in army manœuvres. I am not yet in a position to reply to the last part of the question.

Hydroplanes on Windermere.

Mr. Russell Rea asked the Secretary of State for the Home Department (1) Whether he has considered the risk to life and property which will be occasioned by the use of hydroplanes on Windermere; and, if he cannot see his way entirely to prohibit their use on the water of a lake which is a public highway, and is traversed by a public steam ferry, if he will institute restrictions as to speed, the area upon which and the hours in the day during which flights of hydroplanes will be permitted; and (2) whether he is prepared to put into force the powers he possesses under the provisions of the Aerial Navigation Act, 1911, to prohibit the establishment of a school of aviation, to be carried on for private profit, on the shores and waters of Windermere?

Mr. McKenna: The powers conferred on the Secretary of State by the Aerial Navigation Act of last session are to prohibit the navigation of air craft over certain areas, either at all times or at such times as may be specified in the Order, or to impose conditions for such navigation, but the powers are limited to the purpose of protecting the public from danger. As at present advised, I am not prepared to make an Order prohibiting the use of hydroplanes over Windermere; but the question of making certain restrictions is now under consideration.

Mr. Russell Rea asked whether the Admiralty have made a contract with a private firm for the construction of hydroplanes on the shores of Windermere, and for testing them on the lake?

The First Lord of the Admiralty (Mr. Churchill): No contract has yet been made, but arrangements are being entered into for the conversion of aeroplanes into hydroplanes by a private contractor at Windermere. The present intention, so long as his works are at Windermere, is to carry out preliminary tests on the lake.

Mr. Watt: Is there any reason why Windermere should be protected from these inroads any more than the Scottish lakes?

Photography and Aviation.

Now that interest in aviation is becoming so general almost everybody seems to make a habit of taking cameras with them to aerodromes, and the average amateur who tries to photograph an aeroplane generally makes rather an astonishing mess of it. Nothing is more interesting than aeroplane photography if one takes the trouble to get good results, and the subject is well worth proper study.

Of course, practically everyone whose uses a camera at all reads *The Amateur Photographer*, or if they do not they ought to, and regular reading of that interesting paper is most helpful, and further to acquire a useful general knowledge of how to handle one's own photographic work everyone ought to have that interesting little pamphlet, "Self-Help in Photography," which is published by Burroughs Wellcome and Co.

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Notes on the Official Memorandum.

BY W. E. de B. WHITTAKER.

The amplification of Colonel Seely's statement on naval and military aviation having been published, it is now possible to form some idea of the future organisation of the Royal Flying Corps. It is apparent that certain of the points mentioned by the Under Secretary of State for War have undergone some alteration since the introduction of the Estimates in consequence, perhaps, of public criticism or of the increasing knowledge of Colonel Seely. The intentionally ambiguous has naturally disappeared, and there is a candid tone in the memorandum which has been lamentably lacking in the actions of the Government.

The paper plans of British Governments have invariably been of great excellence, and they have not deteriorated of late. Therefore the general policy and general principles of the present Memorandum are beyond reproach, and, as ever, it only remains to act on them.

It is reiterated that the Royal Flying Corps shall be an undivided Service, supplying aviators for both Army and Navy.

It is stated that "in a purely naval war the whole of the Royal Flying Corps should be available for the Navy, and in a purely land war the whole corps should be available for the Army." Yet a little later on in the Memorandum one reads that "the Royal Flying Corps, with the exception of the Naval Wing and officers and men of the Royal Navy and Marines who are members of the Reserve of the Royal Flying Corps, will be under the administration of the War Office."

That is to say, that all that concerns the Navy will be under Admiralty control, and all that concerns the Army under the direct influence of the War Office. The Central Flying School, built on Army land, will, in return for monetary assistance in the erection of the necessary buildings and the supply of school machines, teach selected naval officers the first principles of "progressive flying." The Aircraft Factory, also financed by the military authorities, will also extend its sympathetic assistance to the Navy. It is a curious position. Perhaps the joint name for two corps will inspire public confidence?

Divided Control.

In the unwritten laws of Governments it is accepted that the surest method of stifling discussion on awkward and trying subjects is to submit such matters to the hands of a Royal Commission. And the silence of the grave succeeds the violence of over-inquisitive debate. Aviation is a difficult business to a Liberal Government. It is not an attractive outlet for the increments of Lloyd Georgian finance, nor does its particular method of destruction appeal seductively to the iconoclasts of Liberalism. Therefore its destinies are ruled by committees, so that what blame there be may disappear by a process of infinite distribution. "The Government propose that a permanent Consultative Committee should be appointed to which questions in connection with flying affecting both departments should be referred by the Admiralty and War Office" (Memorandum, p. 4), and also "The Aeronautical Advisory Committee will continue its experimental and research work on the present lines . . . " (Mem., p. 3). And, as I have pointed out before in these columns, control by committees means too frequently the fostering of abuses and death of efficiency. On active service the general who has a deep affection for councils of war does not inspire confidence. The question of the effective command of the Royal Flying Corps in peace and in war is one of the greatest importance, and should be treated as such. It is to be hoped that the commanding officers of the military and naval wing will be consulted properly before any step is taken.

The *personnel* of the Royal Flying Corps will be composed of officers and men of the Navy and Army and of civilian aviators and mechanics. It has been previously understood that, before going to the Central Flying School for advanced training, all officer-pilots must have the aviator's certificate of the Royal Aero Club. On appointment a payment of £75 will be made to each pilot to defray the expense of taking his certificate.

It appears, however, that such officers as are to be on the establishment of the Naval Wing will receive their entire aerial training at the official school on Salisbury Plain. No reason is given for this distinction. The consequence will be that the advanced courses of training at the Central Flying School will suffer some disturbance owing to the presence of a number of beginners who possibly have never before even seen an aeroplane.

Civilians.

For the last three or four hundred years it has been the custom in most countries of the civilised world to entrust the question of national defence to a specially trained professional class of soldier. Militarism has formed a caste for itself, separated almost entirely from civil life. Soldiers have been trained as such from their youth, and the civilian, in excess of a certain age, is debarred from joining the regular forces of the country. And, because that intangible quality of *esprit de corps* created by the continued association of a body of men united for one object has so much to do with the attaining of success in the trials of war, it is, perhaps, well that there is little chance of interchange between the civil and the military life. The ideals and the practice of existence are different.

But from time to time new sciences spring to the front, new discoveries are made, and journeys take place along previously untracked wastes of human knowledge. And perhaps this new science, these new discoveries, may arrive at a stage of practical utility before it is realised of what great use they are to the soldier and his profession. It follows, consequently, that a certain number of civilians will be expert in their knowldege of the new science. about the time the soldier has discovered its uses. And, as to be prepared is the first step towards success in warfare, it becomes necessary to employ in the professional Army these civilians of knowledge.

So it is largely in aviation that its scientific advance is almost entirely due to the civilian. Until it reached a stage of comparative safety it was not deemed wise to risk public money and the lives of trained soldiers on the advancement of the science, vital though it is to the art of war. It has for this reason become necessary to employ a number of civilian aviators, for a time at least. Hence the statements of Colonel Seely in the House of Commons.

One gathers from the Memorandum that the naval wing of the Royal Flying Corps will be entirely manned from officers and men on the active list of H.M. Navy. In the case of the military wing a few civilians may be admitted as officers, and a large number of civilian mechanics will be enlisted direct. The Reserve of the Royal Flying Corps, on the other hand, will be largely composed of civilian aviators. This is entirely as it should be. If efficiency is to be considered at all the permanent active establishment should always consist almost exclusively of soldiers. To use up the civil flying talent of the country as an effective, if not particularly efficient, reserve follows naturally.

Pay.

The question of pay is not dealt with in the Memorandum, and one is unable to forecast the probable rates. There seems to be a mistaken impression that the civilian aviator whose application is accepted should be paid at a rate highly profitable to himself. The defence of one's country should never be a matter of personal profit, but it is hard, perhaps, entirely to eliminate the commercial

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instinct of the Englishman. Civilians appointed for continuous service should receive the same pay and allowances as the soldier-aviator. The method adopted during the South African War of paying volunteers extravagantly for their inefficiency is not one to be admired or followed. The position of civilians on the Reserve is different. As they are employed for only a limited period annually they should receive pay commensurate with the disturbance caused to their ordinary business by their periodical forced absences.

Pilots.

The period of continuous service with either the military or naval wing has been fixed at four years. It is probable that the question of flying nerve has had something to do with this decision, but the time seems to be rather short. At the moment when an officer has reached his highest efficiency he has to return to his regiment, with which he has probably lost touch. Experience alone can teach us the length of service possible for a military aviator, in which case it is a little absurd to state a definite period. The period of enlistment for mechanics and of service for transferred men is also four years, with, however, permission to re-engage annually.

For each aeroplane in the seven squadrons forming the military wing of the Royal Flying Corps two pilots are to be allowed. The pilots of single-seaters will, as was to be expected, both be officers. In the case of two-seater aeroplanes one of the two pilots will be a non-commissioned officer. It is intended for the present, however, to train pilots drawn in equal numbers from officers and men.

Though at present no figures are known with certainty, it is proposed to form a casualty reserve at the rate of 100 per cent. for six months' wastage. This rate seems unnecessarily high in time of peace, but it must be remembered that all squadrons formed at present are to be maintained on a war footing, which is to say that four pilots will be needed per machine—a proportion which experience will probably modify very considerably when it is found how many machines a pilot can dissolve into its original elements without serious damage to himself.

(To be continued.)

French Military Aviation.

The recent long series of accidents to military aviation has directed official attention to the question of the physical condition of the pilots, and a circular has been issued containing new regulations regarding the selection of army aviators. It ordains that great care should be taken in the choosing of officers, N.C.O.'s and men for service in the "fifth arm." Good physique is of the greatest importance, and excellent sight is imperative. Further, only pupils showing distinct promise are to receive appointments.

The Minister of War desires that serious attention shall be devoted to ascertaining the minimum strengths required in various parts of the aeroplanes delivered for military purposes. Also he advises that investigations shall be made into the question of aeroplane stability by the different military aeronautical establishments.

The necessity for prudence in the selection of times for aerial practice and in the choosing of aerial exercises is insisted on, as also is the necessity for constant examination of the aeroplanes engaged in army work.

Lieutenant-Aviator Thierry de Ville d'Avray was killed at Verdun on April 19th while flying a Blériot monoplane. He began a *vol plané* from a height of about 100 metres. When about half that distance from the ground his wings appeared to fold backwards, and the machine fell in a heap to the ground. The unfortunate aviator was found with his legs *under* the motor. His skull was fractured, his thigh broken, and he had several serious internal injuries. He died in a short time without recovering consciousness.

M. Millerand and M. Poincaré (the President of the Council) held a review of military aeroplanes at Villacoublay on April 18th. In attendance on the Ministers of State were General Roques, Colonel Hirschauer, Lt.-Colonel Bouttieaux, and Commandants Renaud and Dorand. The military aviators all arrived by aeroplane. There were present Captains Etévé, Leclerc and Mauger-Devarennes, Quartermaster Quennehen from Saint-Cyr, Lieutenant Noé from Buc, Commandant Felix, Lieutenants de Geyer and de la Morlaye and Sapper Letort from Etampes.

Twenty-six aeroplanes were marshalled for inspection. Monoplanes—6 Nieuport, 5 Blériôt, 1 R.E.P., and 1 Canard Blard; Biplanes—5 Maurice Farman, 2 Astra, 2 Dorand, 2 Bréguet, 1 Henry Farman, and 1 Military Wright. A R.E.P. monoplane was assembled from its packed state in the presence of the two statesmen. A flight was made on it, after which it was repacked. MM. Charles Nieuport, Gobé and Hélén made several flights on Nieuport monoplanes, as also did Labouchère on a Dorand biplane. The review was quite successful.—W. E. de B. W.

The Aeronautical Society.

The next election of Associate Fellows will be held in June next. The last day for the receipt of applications will be Tuesday, May 28th, and the result of the election will be declared on Wednesday, June 12th.

Programme of Meetings.—To be held at the Royal United Services Institution: April 29th, Monday, 8.30 p.m., chairman, Dr. W. N. Shaw, F.R.S.—Capt. C. H. Ley, F.R.Met.Soc., on "Aerial Topography." May 8th, Wednesday, 8.30 p.m., Brig.-Gen. D. Henderson, D.S.O., C.B., on "The Design of a Military Scouting Aeroplane." May 16th, Thursday, 8.30 p.m., F. H. Bramwell on "National Physical Laboratory Research." June 12, Wednesday, 8.30 p.m., G. Holt Thomas on "Hydro-aeroplanes."

Programme for Session 1912-1913.—The meetings of 1912-13 session will be held on the second and fourth Wednesdays at the Royal United Service Institution, at 8.30 p.m., beginning October 9th. The programme at present arranged is as follows: W. O. Manning on "Propellers"; Col. F. G. Stone on "Aircraft as Targets for Artillery"; R. L. Howard Flanders on "Stress Diagrams"; M. O'Gorman on "Some Stability Devices"; Arch. R. Low on "Aeroplane Construction"; B. G. Cooper on "Peculiarities of Insect Fight"; L. Bairstow on "The Law of Similitude"; Horace L. Short on "Doubled-engined Aeroplanes"; A. Arkell-Hardwick on "Breaking Stresses"; Col. H. E. Rawson on "Meteorology."

Informal meetings are held at the Society's Offices, 11, Adam Street, Adelphi, on Mondays from 5 p.m.

The Disappearance of Mr. Damer Leslie Allen.

It is to be feared that all hope must now be given up of ever seeing Mr. D. L. Allen again. It will be recollected that he and Mr. Corbett Wilson, of Kilkenny, started on Thursday afternoon last to fly to Ireland. Mr. Allen reached Chester the same afternoon, and on Friday, soon after 6 a.m., left Chester, and was seen passing over Holyhead about 8 a.m., since when nothing has been heard of him.

Mr. Allen's loss is a most regrettable one for many reasons. A naval architect by profession, he had taken up the subject of aviation as a really serious student and not merely as a pilot, though he turned out to be an extremely fine flier. His first cross-country trip was on the previous Saturday, when he flew from Hendon to St. Albans and back. The fact that he reached Chester, in spite of losing his way to some small extent, shows that he had undoubtedly a gift for cross-country flying, so that he might well have proved a most valuable acquisition to the very small band of men who are at once capable of designing and flying an aeroplane.

It is unfortunately only too sure that he started on his cross-channel trip without thoroughly weighing the risks, for his machine was not fitted with floats and he did not wear a lifebelt. Also having flown 84 miles from Chester to Holyhead, it would certainly have been wiser to have come down there to make sure that everything was right for the remaining 60 miles. Of course, in these days of long-distance flights lasting for many hours, a mere matter of 150 miles does not sound much, but it is well to remember that though many such flights are made, the number of such flights which are attempted and are cut short by engine failure is very much greater. There seems to be an unfortunate impression that, when once it is got right, the Gnôme engine will keep on running till the petrol and oil are exhausted, but Mr. Raynham's accident on Sunday at Brooklands is sufficient proof that no real dependence can be placed on it or on any other engine as yet, and therefore every precaution should be taken against an unintentional descent.

There is, of course, just the remote chance that Mr. Allen may have been picked up by an outward-bound steamer which is not fitted with wireless, and that he may be heard of again. Let us devoutly hope that it may be so.

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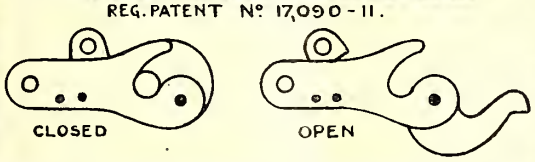

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On April 10th we presented a dozen yards of rubber to Mr. Waterfield, 19, Chedworth Street, Plymouth, and a set of parts to Mr. Moore, 92, Jersey Road, Wolverton. There is £5 in cash and a "Mann" Tractorplane waiting for somebody!

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Aviation in Germany.

BY A CERTIFICATED AVIATOR.

During the Easter Holidays there has been held for ten days in the Exhibition Hall of the Zoological Gardens in Berlin the first German Aircraft Exhibition. Its proper title was the Allegemeine Luftfahrzung Ausstellung, but it was usually known by the popular and very necessary abbreviation A.L.A., which possessed the additional charm of a dash of resemblance to a foreign expression, the use of all which is so dear to the heart of the Prussian.

The exhibition was heralded in the German Press in no uncertain terms, and claims in the preface of its own catalogue to show that the Fatherland is well on its way to a place of equality in air matters with any other country. Great pride is taken in the thoroughness of construction of the German machines and in their practicability, and in comparing the exhibition with the recent Paris Salon one periodical refers to the amount of "Bluff" (the expression is theirs) to be seen at the latter as exemplified in such exhibits as the Deutsch de la Meurthe limousine body.

The same paper calls attention with some satisfaction to the recent French order forbidding the flying of the French military monoplanes until their planes have been reinforced, stating that practically no German machines have failed in this respect.

While making every allowance for the innate self-appreciativeness of the Germans, it must be confessed that they have very considerable reasons for satisfaction and optimism. The aircraft movement in Germany—and I use the term aircraft advisedly, for the uses of the dirigible have not been lost sight of nor progress in them been abandoned—is booming. At present a young and healthy industry, under the benign influence of liberal and well-directed Government support, and of the popular enthusiasm now rapidly awakening, it can be prophesied with absolute safety that it will soon be making tremendous strikes to make up for lost ground.

Everywhere one sees busy growing works full up with orders and crowded schools and flying grounds.

Royal favour, a particularly important factor in Germany, is lavished upon it: the Kaiser has presented his prize for the best German motor. Prince Henry, himself an aviator, opened the exhibition with a stirring speech, and takes a keen interest in pushing aviation forward.

As in France, a public subscription is being raised for the purchase of aeroplanes for the nation; already several towns have collected a sufficient sum to purchase a machine which will bear their name.

Whatever may be thought of the advisability of the public subscribing money for work which should properly be carried out by the Government, it shows what the people think on the subject, and what the people want governments will, and, in fact, in these days must, give. The eager desire to be pushing forward is, of course, chiefly due to the progress and leadership of France in aviation matters, and fear of the advantages which in war she might reap therefrom.

Though the last people in the world to deprecate the importance of personnel, the Prussians learned from their "needle-gun" in their war with Austria in '66 the tremendous advantages that may be gained from superior materiel in the form of new invention. In the war of '70, Von Moltke illustrated what superior reconnaissance meant. Neither of these two lessons has been wasted on the German people.

The Show.

But to return to the "Ala." A detailed list and description of exhibits is not wanted. In these days, soundly designed and constructed machines are not very scarce; machines badly designed, or badly constructed, or both, are, unfortunately, still fairly common, and all these types were to be seen at the "Ala."

From the broader and national point of view the things to be looked for in an exhibition are, firstly, the capabilities of the various firms for producing sound machines *in quantities;* and, secondly, any new ideas either in constructional principles, which might lead to improvements in type, or in details.

Under the first head the following firms are probably the most worthy of notice:—

The Rumpler.—This firm constructs machines of the well-known Austrian Etrich type, popularly known in Germany as the *Taube* (Pigeon). They and their performances are so well known as to need no further description. They have large works and a school at Johannisthal, have 16 machines on order from the German Government, and are training a number of officers in flying them. Hirth, probably the best flier in Germany, is their chief instructor, and will soon be flying a new and exceedingly fast 100-h.p. machine, in which head resistance has been reduced to a minimum, and streamline form applied to every detail.

The Aviatik have works at Mulhausen and two schools at other places, where they are instructing 30 or more officers to fly their machines, eleven of which were recently ordered by the Government. They have had over two years' practical experience of building Farmans, and have now launched out into monoplanes.

The Albatros have works and a school at Johannisthal, and the former are being considerably enlarged. They have recently had Government orders for 15 machines and are instructing a number of officers in flying them. They also have two years' experience of building Farmans and have now commenced monoplanes and tractor biplanes. One of the latter was on exhibit and a photo of it is shown.

The L.V.G. (Air Traffic Company) are a firm with large capital behind them. They already own three Parseval dirigibles, and some purchased Farman and Morane aeroplanes, on which they have trained some thirty pilots. They have now engaged Herr Schneider, of Nieuport fame, and exhibit a monoplane of that type of his design. Though their first machine, and one which has not yet been flown, it can almost be relied on with such backing to take a leading place in German aviation.

The Albatros Biplane, one of the best German machines.

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To the machines of these firms we may, I think, look in the immediate future for the most noteworthy results in Germany.

The Harlan and Euler firms have also received small orders from the Government for two or three machines each. The Farman type of the latter company is popular amongst private buyers. On it Prince Henry and some twenty army officers have already taken their certificates.

The Grade machine is a small monoplane on which no less than 45 pilots have already been trained, a popularity no doubt due in no small measure to its cheapness. For military purposes its value would not be great.

In all about three dozen machines were exhibited. Generally speaking, noticeable features were the popularity of the Etrich wing tip, both for monoplanes and biplanes, and of upward instead of downward working ailerons on Farman biplanes; also the universal use of German motors.

The most popular of these were the Argus and Austro Daimler, but no less than thirteen German firms are manufacturing aero engines. None but German engines are to be seen in the exhibition, and it is a noteworthy fact that of the 70 or 80 airworthy machines now at the flying ground at Johannisthal only about a dozen are fitted with Gnôme engines.

Under my second heading, namely, that of machines embodying new ideas, by far the most interesting exhibit is the Fokker aeroplane. It claims to be automatically stable, and Herr Fokker, the designer, supports his claim by not fitting it with warp or ailerons for lateral control of any description and himself flying it almost daily at Johannisthal; and that, too, in weather when few, if any, other machines will go up.

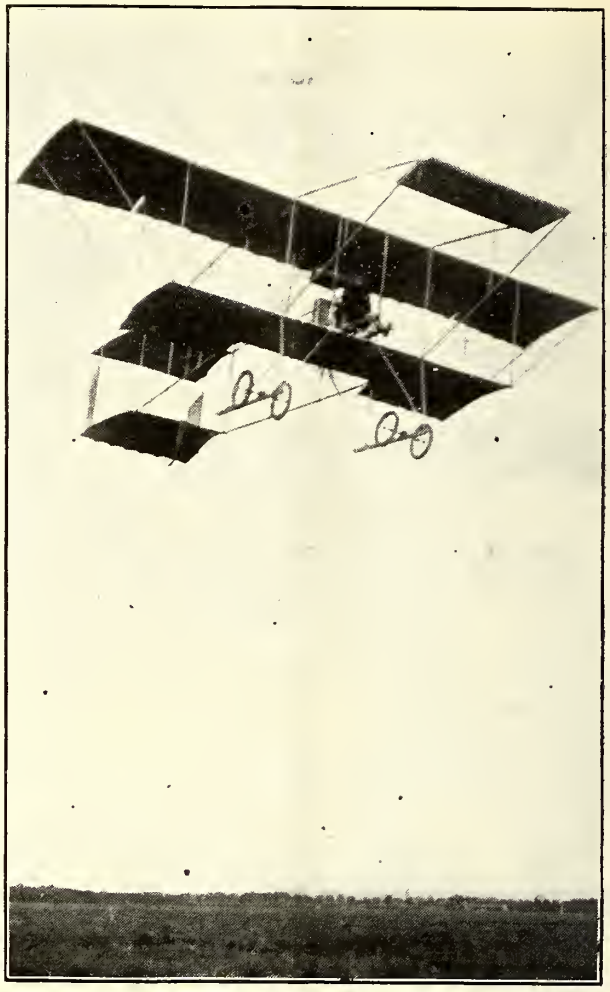
The writer is not himself in a position to say to what extent other well-designed monoplanes possess this quality, but would very much like to hear the opinion of some of our own good monoplane fliers on the subject. Nor does it appear to the writer from close observation both from the ground and as a passenger that the vertical rudders are used to any extent for maintaining lateral equilibrium.

A picture of the machine is shown—the wings have a large dihedral angle running up at an angle of about 1 in $4\frac{1}{2}$, and are also set lightly back. The machine has easily removable wings, a strong landing chassis, and shows evidence throughout of clever design. It has only been flying for a few weeks, and by its exceptional performances is creating considerable interest.

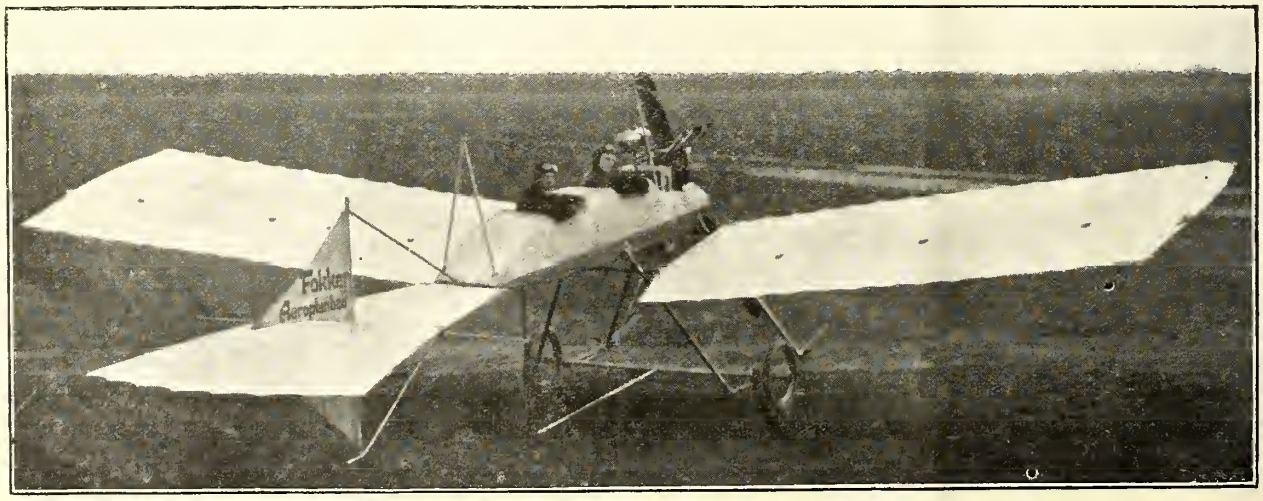
There is little doubt that Herr Fokker, who is a Dutchman, is a flier of exceptional ability.

Another interesting exhibit is the Loutzow double-engined machine. The tractor screws are placed one immediately in front of the other, the shaft of the front one being solid and running through the shaft of the rear one, which is hollow. The motor of the front screw is directly behind it; that of the rear screw beneath and to the rear of it, power being transmitted by a shaft and chain drive. The machine weighs no less than 3,000 lb., but a very high speed is claimed for it.

Some of what may be called "exhibition exhibits" consist of several aeroplanes with entirely enclosed bodies, in appearance not unlike the private hansoms of the old days, a biplane carrying, regardless of head resistance, two five thousand candle-power illuminators on the struts between the planes, and a monoplane with a bullet-proof shield for engine and pilot. The chief interest of the latter lies in the fact that two millimetres of Chrome nickel steel will keep out modern rifle bullets at a distance of 1,000 ft., or, in other words, protection from an enemy's rifle fire may be had at the price of only about 3 lb. weight per square foot.



The Euler Biplane—a box-kite which still survives in Germany as in this country. On one of these machines Prince Henry of Prussia learned to fly.



The Fokker Monoplane—a German built machine for which absolute automatic stability is claimed.

The Week's Work.

Much Flying and a Chapter of Accidents.—Mr. Yates' Somersault—Mr. Fisher Lays Himself Up—Lieut. Parke's "Discontinuation"—Mr. Raynham's Gnôme Bursts in Mid-Air—An Australian Brevêt Winner—Italian Officers at the Bristol School—The Gnosspelius Hydro-monoplane Busy—M. Caudron at Hendon—The Isaacson-engined Blackburn going strong—Grievances at Brooklands—The Liverpool Fliers at Work Again.

Monday, April 15th.

Brooklands.—At Bristol School, Lieuts. Lewis and Mackworth in turn. Later Mr. F. Fleming testing, but weather bad.

Eastbourne.—Mr. F. B. Fowler flew new machine two circuits in gusty wind.

Hendon.—Wind rather high for school work, but at the W. H. Ewen School, Lieuts. Kerrich and Pennycuick managed to get in practice early in morning.

At Blériot School pupils busy, rolling and flying.

The Plain (Bristol School).—In afternoon trial by Mr. Pixton on Bristol two-seater. M. Jullerot on same at 600 to 700 ft., but wind too strong for school. By 5 o'clock wind dropped, so Mr. Smith-Barry for a solo on biplane. Lieut. Ashton and Mr. Jennings also out. Mr. Pixton on two-seater monoplane, and then Lieut. Antonini at 300 to 400 ft., covering 20 miles, and landing very neatly. Mr. Gordon England out on one of tractor biplanes, flying splendidly. Mr. Bendall out with mechanic as passenger on biplane No. 55. Lieut. Antonini another trip on two-seater monoplane. Senor Campana for solo on single-seater monoplane, but landed heavily and buckled wheel. Mr. Bendall flew over with a mechanic, and machine brought back to sheds.

Waterloo (Liverpool).—Mr. Melly took out Anzani-Blériot and finding weather favourable, handed over to Mr. Hardman, who did several straight flights. Mr. Birch had first rolling practice.

Windermere.—Two straights by Mr. Kemp and first turn and *vol plané* on Gnosspelius hydro-monoplane.

Tuesday, April 16th.

Brooklands.—At Bristol School, Lieut. Mackworth out early, caught by gust when landing and broke a chassis strut. In evening Mr. Fleming testing.

Mr. J. R. Duigan on Avro with 35-h.p. E.N.V. doing straights.

At Deperdussin School, Lieut. Chinnery out 15 mins. Mr. Petre and Mr. Sabelli both flying well.

Hendon.—At W. H. Ewen School work started at 5 a.m. Miss Prentice, Messrs. Ware and "Edmund" and Lieuts. Pennycuick and Kerrich all managed to get in some splendid practice for nearly two hours when rising wind put an end to practice.

At Grahame-White School Messrs. Hucks and Manton out on biplane No. 4, Mr. Hucks flying several circuits and Mr. Manton rolling.

At Blériot School Messrs. Welburn, Thomsen, Morris, Pothet, Teulade and Clappen at work. Mr. Tremlett took certificate in good style.

The Plain (Bristol School).—M. Jullerot for trial on monoplane to 1,000 ft. Mr. Pixton also out on one two-seater for about 10 mins. with Lieut. Hall as passenger. Later Mr. Smith-Barry on biplane No. 55, banking steeply. At 6 p.m. M. Jullerot with Lieut. Ercole, pupil in charge. Lieut. Rinaldi for his first tuition by M. Jullerot on No. 55. Mr. Bendall flying one of tractor biplanes for first time and performing very well, making good landing. Lieut. Antonini fine exhibition on monoplane. Mr. Smith-Barry on biplane, followed by Mr. Gordon England on tractor.

Windermere.—Adjustments to Gnosspelius hydro-monoplane in hangar.

Wednesday, April 17th.

Brooklands.—At Bristol School, Mr. Pizey testing with Lieut. Mackworth. Latter up alone, but too windy for certificate flights. In evening Mr. Fleming for trial, and then with Lieut. Lewis and later with Mr. Nesham. Mr. Mackworth up for 10 minutes' solo. Mr. Pizey up with Miss Seddon as passenger. Mr. Nesham for solo, 10 mins.

At Deperdussin School, Lieut. Porte, R.N., out on racer in bad wind. In evening Mr. Petre on brevêt machine.

At Flanders School, Mr. Fisher out testing propeller, and in evening flying 10 mins. in gusty wind.

Eastbourne.—Mr. Fowler flew new machine, and Mr. Yates flying Gnôme Blériot at 500 ft. Both Mr. Fowler and Mr. Yates found horrible *remou* to the west of Hampden Park under the Downs.

Hendon.—Two new pupils, Messrs. H. H. James and J. H. James, joined the W. H. Ewen School.

At Grahame-White School Mr. Lewis Turner out on biplane No. 5, taking up photographer, afterwards making several solo flights. Mr. Hucks, on monoplane No. 6, made several circuits and a cross-country flight during the day. Mr. Lewis Turner also out for test flights on biplane No. 1.

At Blériot School pupils working hard.

The Plain (Bristol School).—M. Jullerot for test. In afternoon M. Jullerot for trial before many visitors, but still found *remous* very strong. At 5 p.m. up with passenger, and made a couple of short circuits, after which for high flight on two-seater monoplane. M. Jullerot later on same machine with Sir Alfred Hickman, Lieut. Gallaher (two prospective pupils) and another visitor. Lieut. Rinaldi and Capt. Grace for tuition flights, and M. Jullerot on two-seater monoplane with Lieut. Hardy. Lieut. Antonini on two-seater monoplane, and then with Lieut. Ercole as passenger. Mr. Gordon England out on one of tractor biplanes, later taking up passenger, machine lifting well. He then took Sir Alfred Hickman on No. 55. Mr. Bendall a solo on tractor biplane No. 64, Messrs. Smith, Barry, and Jennings flying same. Three good solos by Lieut. Hall on biplane. Mr. Bendall, with Lieut. Rinaldi on No. 55, and Lieut. Ashton out on No. 43. M. Jullerot and Mr. Smith-Barry over to Fargo, where Mr. Gordon England had landed on No. 55, afterwards both machines flying back.

Waterloo (Liverpool).—Mr. Birch out rolling very satisfactorily.

Windermere.—Trying new propeller on Gnosspelius hydro-monoplane. Straights, one down to Lakeside, then up from Lakeside to Bowness, 6 miles. Mr. Kemp enjoyed long straight; says it is fine to get to know a machine nicely in one flight—then back again to Hill of Oaks. Afterwards several circuits with nice banked turns.

Thursday, April 18th.

Brooklands.—At Bristol School, Mr. Pizey teaching Lieut. Lewis. Lieut. Mackworth took certificate, flying very neatly and steadily at 300 ft. Lieut. Lewis for first time alone, doing hops and shaping well. Mr. Fleming out testing, landed with engine cut off, when Deperdussin pupil, in early rolling stages, cut across in front and collided, damaging left side of planes.

At Sopwith School, Mr. Raynham very busy on Burgess-Wright, giving tuition to Messrs. Howard Wright, H. S. Powell (new pupil), and Hedley, nearly two hours' solid work.

Mr. J. R. Duigan doing straights and a circuit on E.N.V.-Avro.

At Deperdussin School, Mr. Turner rolling, and collided with Bristol, which landed behind him, so that on turning he ran into it without seeing it till too late. In evening Mr. Petre out on brevêt machine. Later Lieut. Chinnery took his certificate, flying well but landing a trifle erratically. Probably practising landing on a mark has spoiled his usual landing, which is as a rule excellent.

At Flanders School, Mr. Fisher flying about 20 mins., going up to 500 ft. Later, Mr. Manning doing good straight steady flights for 30 mins. Then Mr. Fisher two circuits and home. On way into Weybridge Mr. Fisher, on push-bicycle, ran into side-car of motor cycle, owner repairing tyre by roadside without lamp. Result, a dislocated left shoulder, which will lay him up for a week. Nasty dangerous things cycles.

Eastbourne.—Both Mr. Fowler and Mr. Yates flying for about 15 mins. in early morning. Later Mr. Yates started on Gnôme-Blériot, and had only reached about 60 ft. when throttle control wire broke compelling him to descend in small field at high speed, although landing was satisfactory. Machine struck an obstruction and turned completely over, throwing Mr. Yates about 20 yards. Machine was completely wrecked, and Mr. Yates was lucky in escaping with badly dislocated wrist.

Hendon.—At W. H. Ewen School all pupils out in early morning and nearly all day. In evening the Messrs. James started rolling. Mr. Ewen out on 28-h.p. Deperdussin for short flight. M. Réné Caudron arrived from Rue and new biplane fitted up.

At Blériot School good work put in.

At Grahame-White School, perfect flying day and school hard at it. Mr. Manton and Major Liles making many straight

flights on biplane No. 3, Messrs. Fowler and Biard at circuits and Messrs. Roupelle, Morris and Shephard all rolling on same machine. On biplane No. 1 Mr. Hucks and Mrs. Stocks busy at circuits, Messrs. Biard and Manton at straights, and Mr. Roupelle rolling. Mr. Lewis Turner, on biplane No. 5, giving instruction to pupils and making several passenger flights. Mr. Hucks and Mrs. Stocks also put in useful work on same machine. Mr. Grahame-White out on biplane No. 10 for test flight, found several adjustments necessary; machine consequently returned to works, Mr. Lewis Turner making further test later. Mr. Hucks also out on monoplanes No. 4 and 6, making several circuits.

Filey.—Mr. Brereton flying well on Blackburn-Isaacson in spite of fog and 20-m.p.h. wind.

The Plain (Bristol School).—Mr. Gordon England first out on tractor, M. Jullerot following on No. 55, then with Capt. Grace for tuition. Capt. Grace out for first solo very successfully. Lieut. Rinaldi up with Jullerot. Mr. Bendall on tractor biplane. Mr. Smith-Barry on No. 66.

In evening, M. Jullerot flew over Amesbury at 800 ft. Mr. Gordon England on tractor took up passenger and did several figures of eight. Lieut. Hall for solo on No. 66, Capt. Grace for two circuits. Latter pupil only at school four days, and showed good progress. Lieut. Ashton two solos, taking up Lieut. Sanders. M. Jullérot tuition to Lieut. Hartraa, Lieut. Gallaher, Sir Alfred Hickman, and a cousin of Capt. Grace's. Mr. Jennings good solo on tractor. Mr. Bendall also up on same machine and then on No. 55. Mr. Smith-Barry was for solo on tractor, but, landing heavily, broke propeller and skid. Mr. Gordon England with passenger on biplane No. 55.

Waterloo (Liverpool).—Mr. Hardman flew two half miles, and did half a circle.

Friday, April 19th.

Brooklands.—At Bristol School, pupils resting in morning. In afternoon, Mr. Pizey out with Lieut. Lewis, and then with other pupils all rest of day.

At Sopwith School, another hard day's work. Mr. Raynham with Messrs. Powell and Hedley flying for 70 mins. in morning. In afternoon, Mr. Raynham with Messrs. Howard Wright and Powell for 40 mins., and alone for 30 mins. Mr. Sopwith with Mr. Howard Wright, and alone for 40 mins.

Mr. J. R. Duigan on Avro-E.N.V. out for about an hour. Up to 200 ft. first time and 300 ft. second. Switched off at highest point and landed well. Third time doing 8's and circuits and nearly came down in sewage farm.

At Deperdussin School, Mr. Petre up for 10 mins., and Mr. Sabelli for 12 mins.

At Flanders School, Mr. Manning doing good steady straights at 15 ft., and landing well.

Mr. Maurice Ducrocq early in morning, having business to transact at Farnborough, flew over, as being less trouble than trying to work out eccentric train times. Met H.M. Airship *Gamma* on way and exchanged salutations with crew. Ran into thick fog at Farnborough and nearly lost sheds. Breakfasted with Air Battalion and came back in comfort later on.

During day Mr. Herbert Spencer, who had been flying well, ran into fence and telescoped elevator.

Eastbourne.—Mr. Fowler out doing circuits on new machine. Mr. Gassler rolling on school machine.

Filey.—Very fine day, although air seemed to have little buoyancy. Mr. Scott flew to Filey and back about 50 ft. up, and handed Blackburn-Isaacson over to Mr. de Villiers, who made steady flight to Filey, but in landing from 40 ft. accidentally switched off, and pancaked, remaining 3 ft. Machine *hors de combat* and surrounded by people, who seemed to give up their occupations to come and gape. Mr. Brereton, who promises to become one of our best pilots, flying the Blackburn-Gnôme splendidly with passenger, in spite of strong side wind. Stability remarkable. Made in all 24 flights, 6 of which with passengers, but always has trouble in landing owing to people, who take no heed of warnings. Some day there will be a serious accident.

Hendon.—At W. H. Ewen School pupils out at 5 a.m. Lieuts. Pennycuick and Kerrick doing some good flights at 20 ft. In afternoon M. Réné Caudron took out the little 35-h.p. Anzani-Caudron biplane in 15-m.p.h. wind, and showed what it could do, his flying creating great impression. Mr. Ewen then made first biplane flight, and in about one circuit reached nearly 1,000 ft., from which he executed a splendid *vol plané*. Starting a second time, Mr. Ewen went for a cross-country spin. On returning after an hour and half flying, he ran out of petrol, and was forced to land 4 miles from aerodrome. 8.15 p.m. before car arrived with petrol, and he started off again. Quite dark, but guided to aerodrome by fires and rockets, and made beautiful landing. Exceptional performance for the Caudron biplane's first day in Britain.

At Grahame-White School Mr. Grahame-White out testing Grahame-White baby biplane, afterwards up with lady passenger on biplane No. 5, followed by Mr. Lewis Turner, who made two passenger flights on same machine, and then on biplane No. 10, executing fine right-hand turns and landing *en vol plané* in great style, afterwards flying to the assistance of Mr. Grahame-White, who had landed on a piece of bad ground and damaged the skids of machine. Mrs. Stocks and Mr. Biard also out on No. 10, Messrs. Morris, Roupelle and Shephard rolling on biplane No. 3, and Mr. Manton doing circuits, day being closed by Mr. Lewis Turner giving passenger flights to several pupils.

The Plain (Bristol School).—M. Jullerot, Mr. Gordon England, Mr. Smith Barry, Capt. Grace (twice), and Lieut. Hall all flying. Mr. Smith-Barry first out, M. Jullerot teaching Capt. Cordner, Lieut. Wall and Lieut. Marshall. Mr. Pixton with Lieut. Hartraa, Mr. Gordon England with Lieut. Wall and Mr. Lang. Solos by Lieut. Ashton and Capt. Grace.

Waterloo (Liverpool).—Mr. Hardman made very pretty flights of half-mile each in nasty wind and perfect landings.

Saturday, April 20th.

Brooklands.—At Bristol School, Mr. Pizey out with Lieut. Lewis. Major Sir Alexander Bannerman up with Mr. Pizey, then former doing excellent eights, and ready for certificate any time. In afternoon Mr. Pizey, with Lieuts. Sheppard (new pupil), Lewis, and Bettington, and Mr. Lane. In race to Chertsey Bridge and back, Mr. Pizey, with Mr. Lane as passenger, won handsomely, flying low. Lieut. Fielding doing good solos. Lieut. Lewis straights, landing well. Later Mr. Pizey out with all pupils for tuition. In morning Mr. Valentine, whose doctor gives a better report of his condition, and decided he could go on flying, took monoplane over to Hendon with Mr. Charteris as passenger.

At Sopwith School, Mr. Raynham, with Mr. Powell and Mr. Howard Wright, and alone, flying for 45 mins. on Burgess-Wright, Mr. Sopwith on same for 15 mins., and later brought out the old Howard-Wright "Family Tank" for half an hour, carrying passengers and flying strongly. Mr. Sopwith, on Blériot, and Mr. Raynham, on Burgess-Wright, raced Mr. Pizey, on Bristol, to Chertsey Bridge and back, but were too heavily handicapped to catch him. Mr. Sopwith busy on Blériot carrying passengers rest of day. Very good show for public.

Mr. J. R. Duigan on E.N.V.-Avro took certificate in very good style. Congratulations to first genuine Australian pilot, for Mr. Duigan built a machine of his own and flew it in Australia in 1909, and built a Wright type glider in 1908. In morning, Lieut. Parke, R.N., intending to go to Hendon, took up 60-80 E.N.V.-Avro to 2,000 ft. and came down in fine glide, engine just turning, as he put it, "to diminish the head resistance of the propeller." Later, filled up with petrol, took Mr. Sayers on board as passenger, and started. At first turn by Paddock machine caught in gust and came down heavily, carrying away chassis. Acetylene-welding of some joints came away like solder, but shock bad enough to collapse tubes in any case. Machine turned on one side and radiators and planes folded neatly on top of passenger's cock-pit, literally "putting the lid on him," so that he had to be carved out through the side of the fuselage. Lucky the machine did not catch fire.

At Deperdussin School in morning, Lieut. Porte, R.N., flew for half hour on racer. Mr. Petre for several minutes on brevêt machine. In evening, Mr. Sabelli on racer 5 mins. Came down to change plug and then up 35 mins. Mr. Petre flying brevêt machine 19 mins.

At Flanders School, Mr. Manning doing good steady flights for half hour, with practice in side-wind and heat-*remou* tactics. Mr. Furbank now well on road to recovery. During past week has been able to go out on motors and to go boating at Richmond. Doctor expects him to be fit for work in a month or so.

Race to Chertsey and back only brought out three machines, Messrs. Pizey, Sopwith and Raynham, who finished in that order. Rumour has it that the authorities propose to put up the sum of £5 for competition for cross-country race every Saturday and Sunday—though Sabbatarian consciences may veto the latter. By careful adjustment the lucky winner may manage to pay his petrol bill, or, at any rate, the cost of his lubricating oil, in this way. It is probably better than the 25 per cent. of gate money, which the stay-at-home pilot will win, as the "desert march" has successfully choked off the "gate," except for members of the B.A.R.C., who arrive in cars. A suggested improvement is a straight footpath along back of banking from station, a light wooden bridge from

woodyard across track, and footpath along existing road across sewage farm, or, at any rate, to Byfleet Road, and new iron bridge. One could then walk from station in 20 mins., instead of 45 to 50. Or a decent 'bus at 1s. per head from station (1s. 6d. return) would pay well.

Unfortunate motor cyclist named Moorhouse ran off track and was killed by running into one of those foolish, unnecessary, and dangerous telegraph poles, a peril alike to aeroplanes, cars, and motor-cycles, which ought to have been abolished long ago. Victim no relation to Mr. W. B. R. Moorhouse, the aviator. Latter is now recovering from queer accident at Huntingdon at Easter. He took up Mr. Garne's R. and M. monoplane, and when just clear of ground found elevator not working. Switched off and came down bump. Hit padded edge of scuttle with his mouth, drove his teeth through his lower lip, and left them sticking in the padding—so rumour says. Contradition from Mr. Moorhouse anxiously awaited.

Hendon.—At W. H. Ewen School pupils out all morning. In afternoon before meeting began M. Caudron gave wonderful exhibition flight, climbing and banking in surprising manner with greatest ease. Mr. Ewen flying in competitions, and little 35-h.p. Caudron creating great impression. Mr. Ewen's speed and stability marvellous, passing 50-h.p. Gnôme biplanes easily, and scarcely being affected by the 25-m.p.h. wind blowing.

At Blériot School pupils out all morning.

At Grahame-White School, in morning Mr. Lewis Turner at circuits on biplane No. 5, making test flights. In afternoon Aviation Meeting in full swing, fully described elsewhere.

The Plain (Bristol School).—Mr. Bendall first up with Lieut. Hartraa, then with Capt. Cordner, Capt. Grace practising right turns. Capt. Cordner and Lieut. Wall with Gordon England. M. Jullerot with Lieuts. Hartraa, Rinaldi, Wall, Capt. Cordner, and three visitors. Good solos by Mr. Smith-Barry, who then took Lieut. Hartraa up. Solos made by Lieut. Head, Mr. Dacre, Lieut. Hall on biplanes, and Lieut. Antonini on monoplane. Mr. Pixton testing monoplane just from the works at Filton, machine flying splendidly; in fact, in typical "Bristol" fashion. Lieut. Ercole on single-seater.

Waterloo (Liverpool).—Mr. Hardman did straight flights. Will soon be doing complete circles and figure 8's. Mr. Birch out rolling, and steered remarkably well; intended trying short hops, but abandoned owing to darkness.

Windermere.—Gnosspelius hydro-monoplane out with covered fuselage. Great improvement. Machine climbs nicely and flies much more strongly.

Sunday, April 21st.

Brooklands.—At Bristol School in morning Mr. Pizey up with Lieut. Sheppard. Lieut. Fielding took certificate in very good style. Mr. Pizey up with Lieuts. Lewis and Sheppard. Former then doing straights in fine style. Mr. Pizey again with Lieut. Sheppard, and then with Lieut. Beatty, R.E.

At Sopwith School in morning, Mr. Raynham up with Mr. Hedley and Mr. Powell for 30 mins. Mr. Sopwith out on Howard Wright "Family Tank" with Mr. Wickham—who has not been flying in America as erroneously reported in another journal, being in England at the time the report was circulated.

In afternoon Mr. Raynham on Burgess-Wright flying in nasty gusty wind at 500 ft. to 600 ft. Coming down switching on and off, he turned between own sheds and main block, over new bridge, when, at about 150 ft., there was a loud explosion and bits of machine flew in all directions, pilot's cap among the rest. For a moment the machine flattened out to a level keel, and people wondered whether the controls had gone. Then Raynham got the nose down, and landed beautifully with a perfect glide, amid cheers from the onlookers. On landing it was found that a cylinder had blown off the Gnôme, carrying with it the semi-circular shield over the engine, and most of the engine-bearers. The errant cylinder had thrown out to the left and plunged straight through the lower plane, making a huge hole. Part of the engine bearers had made another hole in the right upper plane, and another piece had caught the peak of Raynham's cap, which he was wearing back to front, and knocked it off without touching him. Fortunately, none of the control wires or levers were hit, otherwise there were all the makings of a fatal smash. Lovers of rotary engines would do well to note that, materials being of equal quality, one stands less chance of blowing cylinders off stationary engines, as there is no big centrifugal strain, and even if a cylinder does blow off, it is not slung out with huge velocity; it probably cracks and stops the engine before parting company. Further, pilots who delight in flying over crowds should consider the effect of a cylinder dropping on to a spectator. Let this be a lesson before real damage is done.

The occurrence was not without its humorous side, for Mr. Sopwith's chief engineer, Mr. Sigrist, on seeing the huge hole in the lower plane, remarked drily, "It looks as if something had made an emergency exit through there."

Of course, everyone was immensely glad at Mr. Raynham's escape, for he is not only one of the best workers and cleverest fliers at Brooklands, but is personally popular, and, in spite of his ability, singularly modest and retiring. May his future career be equally fortunate.

Rest of afternoon windy and full of *remous,* and only people out were Mr. Pizey, with several passengers, on Bristol biplane, working very hard, and Mr. Sabelli on the little Deperdussin racer, who went up to about 1,000 ft. and found strong but fairly steady wind, staying there for about 45 mins. Already high reputation as pilot steadily increasing through these continued long flights on the tiny "Dep.," which must be highly efficient.

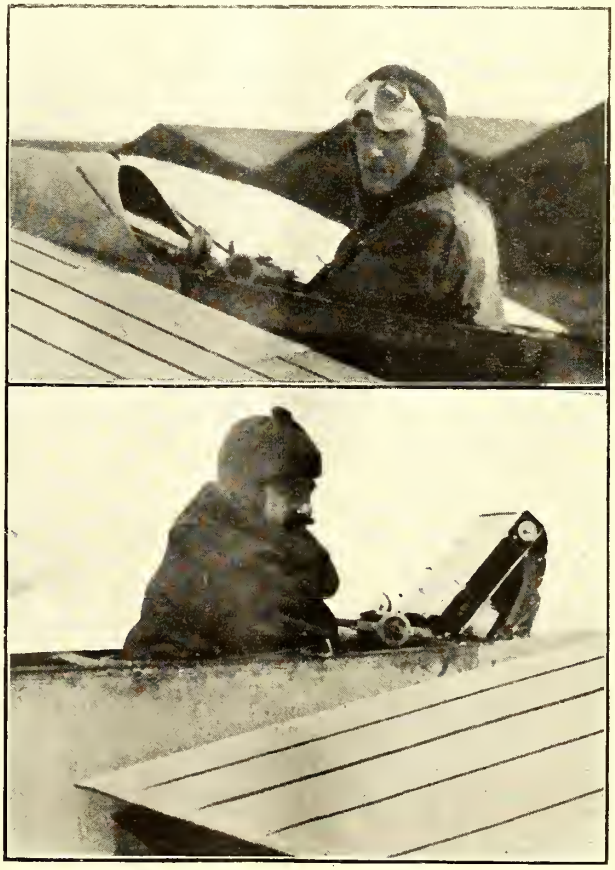
Fine performance by that keen young sportsman, Lieut. Hewlett, R.N. Had to be at church parade at Weymouth on Sunday at 12 noon, and had to be on duty at Weymouth at 7 a.m. Monday. Made a bet he would go to Brooklands and fly in the intervening time. Left Weymouth per motor-bicycle soon after 12.30, had three punctures and a broken belt, but turned up smiling about 5.30. Waited for wind to drop, duly flew, and returned to duty.

Filey.—Blackburn-Isaacson out again, but owing to defective skid Mr. Brereton, in landing, "did in" left side of chassis.

Hendon.—In morning at W. H. Ewen School, Lieuts. Kerrich and Pennycuick doing some good flying and nearly ready for brevet tests.

In afternoon fine exhibition flying by Messrs. Grahame-White (Nieuport), Hucks (Blériot), and Lewis Turner (G.W. biplane), last named carrying 14 passengers.

The Plain (Bristol School).—Mr. Gordon England solos, and with Lieut. Hartraa and Mr. Lang. Mr. Pixton with Lieut. Hartraa, M. Jullerot on No. 66, Lieuts. Head and Ercole on single-seater monoplanes; Mr. Smith-Barry on biplane at fully 1,000 ft.; Mr. Dacre for solos; Mr. Bendall with Lieut. Hartraa and Lieut. Rinaldi.



Above, Mr. D. L. Allen; below, Mr. Corbett Wilson, starting for Ireland on Thursday last.

London Aerodrome's First Spring Meeting.

It really looks as if Londoners were beginning to take an interest in flying, for there were something like fifteen thousand people at Hendon on Saturday, and they seemed very well pleased with what they saw. Moreover, their interest was intelligent. Certainly the flying was excellent, and full of variety, and when a few more good fliers are located at Hendon the flying there will be second to none in the world.

The first event, which was started commendably near the advertised time, considering it was the first meeting, was the figure of eight competition which was won by Mr. Gustav Hamel, who did the most astonishing banked turns and cannot have lost a second at the pylons. Mr. W. H. Ewen, making his first public appearance on the little Caudron, put up an excellent performance, the tiny machine showing itself terrifically fast with its small 35-h.p. Anzani engine, and banking beautifully at the corners in spite of the very puffy wind. His time was returned as being slower than that of Mr. Lewis Turner's Grahame-White biplane, but possibly that was due to his taking No. 6 pylon the wrong way round in the first lap, and having to do a lap extra, as he certainly seemed to be travelling very much faster. Mr. Turner flew as well as ever, and put in a very pretty performance for second place.

The cross-country handicap provided a run-away win for Mr. B. C. Hucks, who was flying the elderly Blériot on which Mr. Grahame-White won the Gordon-Bennett race in 1910. The 100-h.p. engine had been taken out and a 50-h.p. put in, and a pair of ordinary wings fitted, but contrary to all expectations, the machine, in spite of her heavy fuselage and chassis, and the old type engine-housing, turned out nearly as fast as Mr. Hamel's machine.

The race was to Harrow Church and back twice, a distance of about 20 miles over all. Mr. Lewis Turner, on the box-kite—a very well-built machine of its type, turned out at the Grahame-White works—had 12 mins. 3 secs. start, and was making good time when he completed the first lap, but he then came down owing to engine trouble.

Mr. Ewen, on the little Caudron, was next away with a start of 5 min. 15 secs. He somehow managed to lose his direct course, and on finding that he could not make up lost time went for a tour round the country, and came in from the direction of Edgware long after the race had finished.

After Mr. Ewen, Mr. Hucks went off with 2 mins. 41 secs. start; then Mr. Valentine, on the Bristol two-seater, with 41 secs. from Mr. Hamel, and then Mr. Hamel from scratch on his 50-h.p. Blériot. At the end of the first lap Mr. Valentine had picked up nearly half of his handicap time on Mr. Hucks, and Mr. Hamel had gained slightly on Mr. Valentine, but at the end of the second lap, Mr. Hucks finished without any impression having been made on his lead, and Mr. Valentine had gained on Mr Hamel, chiefly owing to the fact that the two latter thought they could not possibly catch Mr. Hucks and had not taken any particular care about making a good course. However, it is to be hoped that next time, now that a little more is known about the relative capabilities of the machines, the finishes will be made rather closer.

The next event was an eight-lap monoplane handicap for a £25 prize, which was presented by Messrs. Teofani, the well-known cigarette firm. It is certainly good to see our business firms presenting prizes in this way, for it shows that people are really taking an interest in aviation, and it may not be out of place to point out that so far as aviators themselves are concerned cash prizes are regarded somewhat more favourably than cups and trophies, and are likely to be so until the ordinary aeroplane pilot is able to earn at least as much money as a taxi-driver. As a matter of fact, the average pilot would very much rather go for a £10 cash prize than for a "pot" of the alleged value of £25. Unfortunately, the time has not yet come when aviation competitions can be organised for true blue amateurs, and certainly so long as the semi-professional pilots of to-day retain the sporting feelings which at present exist, there is no particular need to bother about amateur definitions. Messrs. Teofani have set a useful example, and it is to be hoped it will be followed.

The monoplane handicap actually provided the finest competition of the day, although only three competitors started, Mr. Hamel being on scratch, and Mr. Valentine having 41 secs. start, and Mr. Hucks 2 mins. 6 secs. from him. This handicap by no means represented the relative speeds of the machines, but owing to Mr. Hucks not being very familiar with the Blériot he did not venture to shave the pylons the way Mr. Hamel and Mr. Valentine did. The latter made a slightly more curved course from pylon to pylon than did Mr. Hamel, with the result that with a lap to go Mr. Valentine was close behind Mr. Hucks, and Mr. Hamel was steadily gaining.

The new competition rules of the Royal Aero Club decree that one competitor must not pass inside or below another, and the rule certainly lends itself to abuses, for unless one machine is very much faster than another the slower man has only to keep wide at the corners in order to stave his competitors off by compelling them to fly a long course. This is what actually happened in this race, though it was quite unintentional on Mr. Hucks' part.

Mr. Valentine made two or three attempts to get above him, but lost so much ground at each attempt that he gave it up, and finally, at the very last pylon, he made a very sharp diving turn, and, coming down on the inside of the course, beat Mr. Hucks by a few yards absolutely on the post. Of course, under the rules he had to be disqualified, which was distinctly hard luck, but, at any rate, he provided the crowd with a real race, which was what they wanted.

After the handicap came an altitude competition for the St. Ivel Trophy, which naturally led to facetious remarks as to the relative altitudes of the competitors and the excellent comestible which gave its name to the trophy. Mr. Hucks was the first up, and when he came down it was found that his barograph registered 3,050 ft. Mr. Hamel, who started soon after, continued flying until it was quite dusk, and it speaks well for the enthusiasm of the crowd that several thousands stayed to watch his descent. His altitude was obviously between 5,000 and 6,000 ft., but when he came down it was found that his barograph had stuck at 3,600 ft., and the marker had neither gone up nor travelled horizontally after that point. Mr. Hamel said that when he found the thing had stuck he kicked it, and punched it, blew at it, and was generally rude to it without effect, but as it registered a greater height than that attained by Mr. Hucks it was quite enough to win the prize, and he certainly gave the public an excellent show. This week Mr. Hamel has gone to France to fly the Pyrenees with a passenger, but hopes to be back by Saturday next.

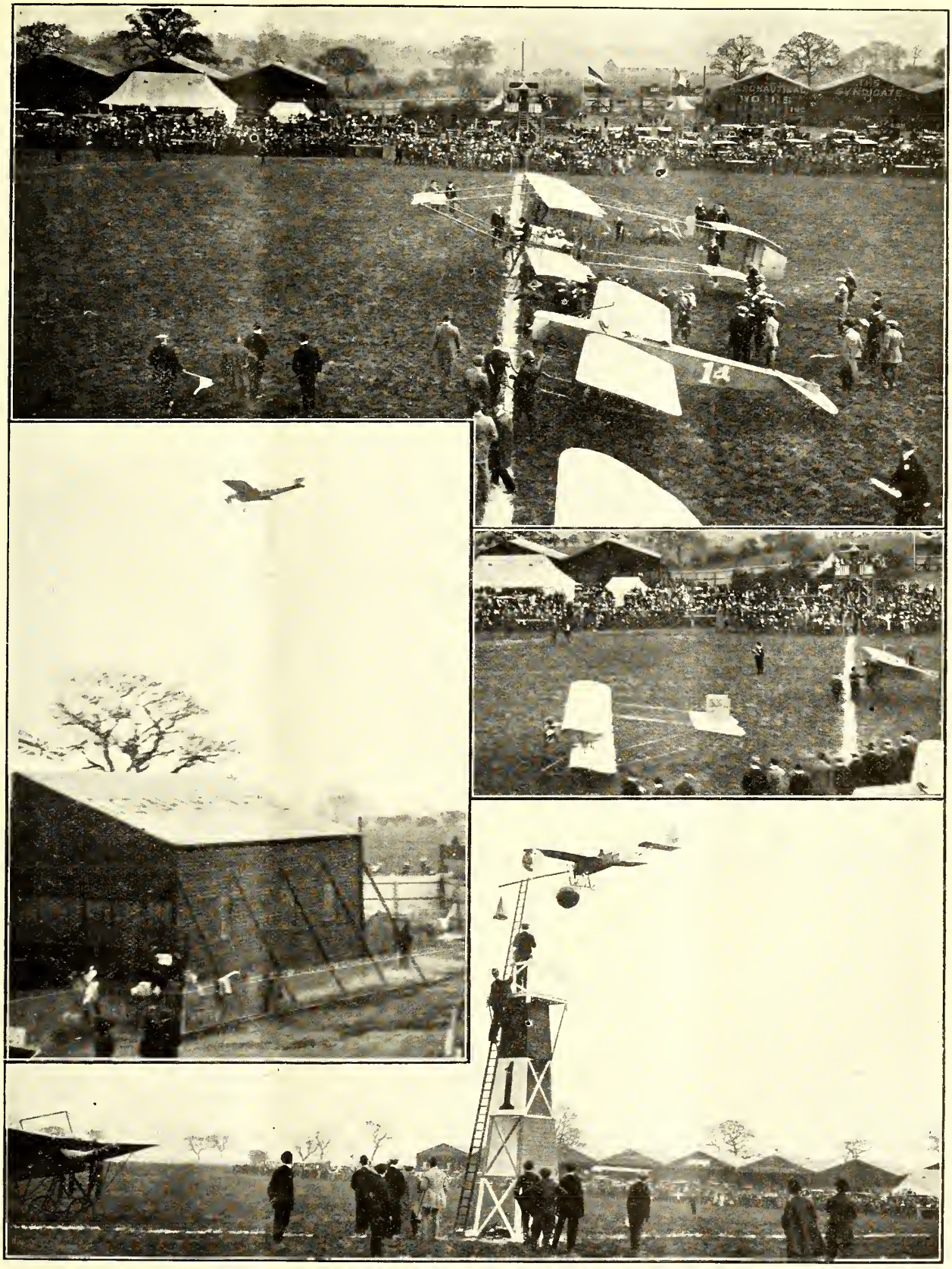
Some 15,000 people were present, and altogether the meeting may be considered a decided success. It is to be hoped that the spectators who were there will impress on their friends that next Saturday, which is the anniversary of Mr. Grahame-White's attempt on the London-Manchester flight, there is another meeting at which, given decent weather, even finer flying may be seen. It is up to Londoners to give Mr. Grahame-White a really good gate to commemorate his fine performance.

The Attempts on the Irish Channel.

Mr. Corbett Wilson, who left Hendon on Thursday last in company with Mr. D. L. Allen, evidently missed his way and landed the same evening near Hereford. Not being able to procure the proper brand of castor oil for the Gnôme, he unwisely filled it up with some other oil and was forced to come down shortly after starting on Friday at Kington in Radnorshire, with everything sooted up. After taking his engine to pieces and filling up with proper oil, he made his way to Fishguard. On Sunday Mr. Vivian Hewitt, who is also a candidate for cross-Channel honours, flew from Rhyl to Holyhead and stayed the night, intending to fly to Dublin next day.

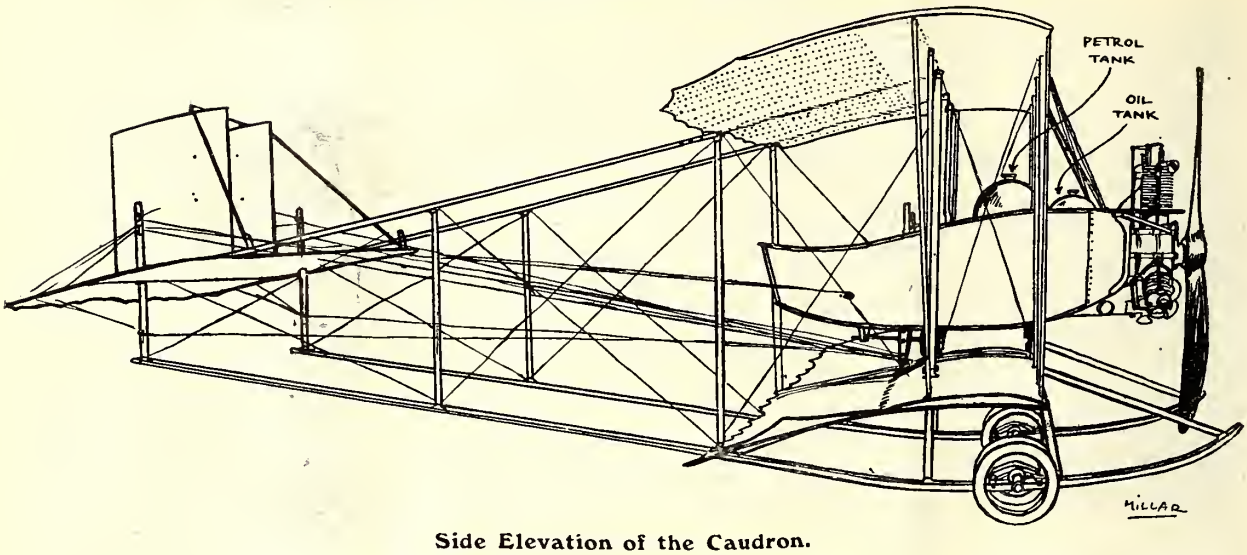
Strangely enough, the papers, in commenting on these flights, write as if the Irish Channel had not yet been flown, ignoring Mr. Robert Loraine's fine flight from Holyhead to Ireland in September, 1910. It is true that Mr. Loraine did not actually land in Ireland, but legally and practically he flew from England to Ireland, for not only did he land inside the three-mile limit, but actually crossed over the Bailey Lighthouse on the end of Howth Head before he fell into the sea. When he did fall into the sea he was well inside the line drawn from the Bailey light to Bray Head at the opposite extremity of Dublin Bay, and he was only prevented from landing in Ireland by the fact that his machine refused to rise high enough for him to land on the top of Howth Head, and that the cliffs thereabouts have no beach at the foot on which he could land, so that to Mr. Robert Loraine will always belong the honour of being the first man to fly from England to Ireland.

On Sunday Mr. Corbett Wilson reached Fishguard, and on Monday morning he made his successful attempt on the Channel crossing, reaching the County of Wexford, and being forced down by rain at Enniscorthy, some 10 miles from the coast. In landing he broke his propeller, and had to wait for another before going home to Kilkenny.



AT THE FIRST SPRING MEETING,—Above: the crowd in the half-crown enclosure at the start of the cross-country race. Mr. Lewis Turner on the G.-W. Biplane just starting, Mr. Valentine's Bristol next, and Mr. Hamel's wing-tip just showing. On the left: Mr. Valentine coming in from Harrow during the race. On the right: Mr. Ewen on the Cauldron starting. Below: Mr. Hamel on the Bleriot rounding the first pylon.

The Caudron Biplane.



Side Elevation of the Caudron.

The Aeroplane has from time to time noted the excellent flying which has been done on the Caudron biplane in France, and its general excellence as a true "popular" machine. It will be remembered that Duval, alone and unassisted, got as far as Lewes in the "Circuit of Europe," and would have gone farther had he not broken down owing to lack of food and sleep. The machine also showed up very well in the recent hydro-aeroplane trials at Monaco.

The sketches of Mr. Max Millar and photographs herewith give a very good idea of the design and construction of the machine.

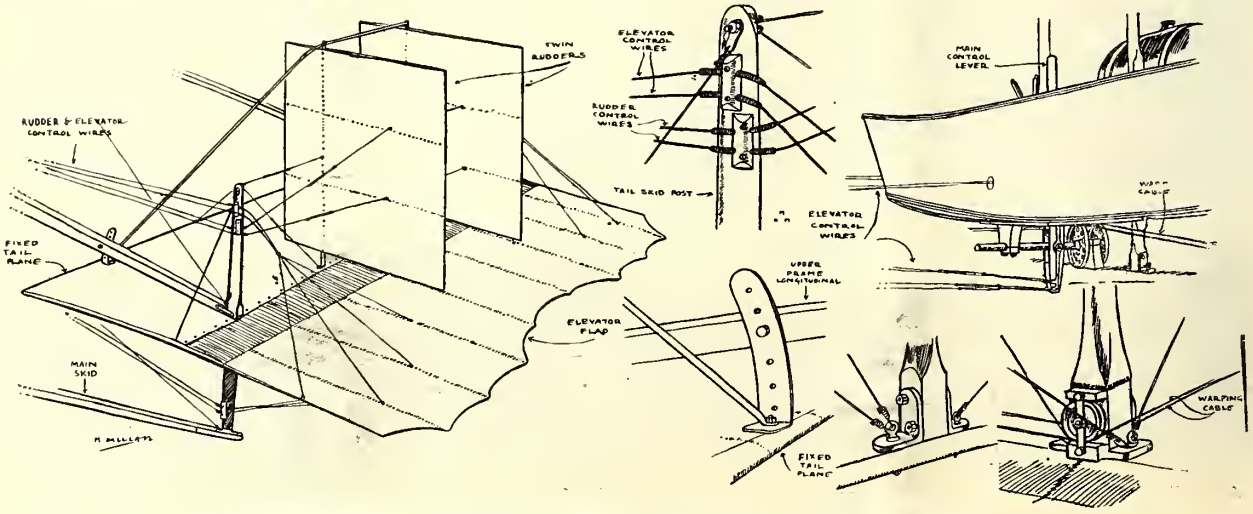
The wings are peculiar in the large proportion of their area which is flexible. There is one row of struts at the front edge, and a second row at one-third or three-eighths of the chord. Behind this the plane is single-surfaced, the ribs being quite flexible. The upper plane has extensions, supported in the usual way by diagonal tubes; but as a protection against possible weakness of the tubes, tie-wires are also used, though they do not show in the sketches, being bound to the tubes with a turn or two of wire at every six inches or so. The outside plane-struts are also of steel tube, which seems to work out lighter than wood; the middle struts, however, to which are attached the chassis and outrigger, are of wood.

One of the outstanding points of this machine is the combination chassis and outrigger—an idea only seen on one British machine, the Valkyrie. In the Caudron, the chassis is of the Henry Farman type—two skids and four wheels—with the exception that there are no struts running to the skids from directly under the body, the skids being held rigid by tie-wires only. The skids carry right back, terminating in two vertical posts, to which are attached the upper outrigger-spars. The tail-plane is fixed to the upper spars, leaving an adjustable fixing at the front edge. The elevator is large, and is arranged to flex, which makes it very powerful. The main spar of the elevator is very strong, and carries the lower ends of the twin rudder-posts, the upper ends of which are carried by a bent steel tube.

The pilot and power plant are carried in a very neat fabric-covered *nacelle*, which is fixed between the main planes, in the manner usually adopted for the fuselage of a tractor biplane. The engine, a 35 h.p. Y type Anzani driving a "Rapid" propeller, is suspended outside in front in the usual manner, with the tanks behind it. At the tail end of the body, which is practically level with the trailing edge, is the pilot's seat.

The control is by an ash universal lever, and is very well arranged; the elevator wires run direct from the lever, which is pivoted near its lower end on a fore-and-aft axle. Sideway movement of the lever rotates this axle, and with it rotate the two drums which carry the duplex warp wires. It is especially notable that not only are the wires duplicated, but the pulleys and drums—in fact, the whole control—is doubled.

The whole design of the machine bristles with good points: for instance, two persons can easily hold it back against the full engine pull, by the simple method of standing on the lower outrigger-spars.



Tail arrangement. Details of elevator and rudder control. "Nacelle" and warping gear. Quadrant for alteration of tail angle. Strut fixing, Warp wheels at feet of struts.

Again, when landing the machine, it runs for a few yards quite fast, after which the tail drops, and then, owing to the braking action of the outrigger, and the very large scale of the main planes, it pulls up dead within about five yards.

In spite of its extreme cheapness, the detail work on the machine is excellent; the engine control levers, for instance, are very large, and are fitted with detent handles, to avoid any chance of undesired movement.—P. K. T.

The Coming of the Cheap Machine.

A few persons who desire to be considered "aero-experts" have from time to time derided the possibility of a cheap but effective aeroplane; but at last they can be refuted by ocular evidence. The writer went to Hendon on Friday last on the chance of seeing a performance by M. Caudron on the biplane which he had brought over for delivery to Mr. W. H. Ewen.

The machine had done a test flight in the morning; and in the afternoon M. Caudron got into it, and proceeded to do an exhibition flight of about half-an-hour, which showed the evident combination of a stable machine, ample power, and a master pilot—an exhibition, in fact, much like those of Hamel on his Blériot or Grahame-White on his Nieuport, with the exception of the speed, which appears to be about 50 m.p.h.

Then Mr. Ewen took the machine up, and after a trial came down filled with delight, saying that the machine did everything except steer itself.

Later on, after more of M. Caudron's splendid performances, Mr. Ewen, at 5.50, went out across country. He had not been seen or heard of when the writer left, but he said later that he lost his way, landed to find it, was again brought down by lack of petrol, and spent nearly an hour in getting a supply. He left the small field, where he had landed, in pitch dark, having a man standing by the far edge (about 50 yards away) to strike matches as a guide to the distance allowable before rising. He landed at Hendon about 8.30, being shown the way by rockets and fires, making a perfect landing without damage of any kind.

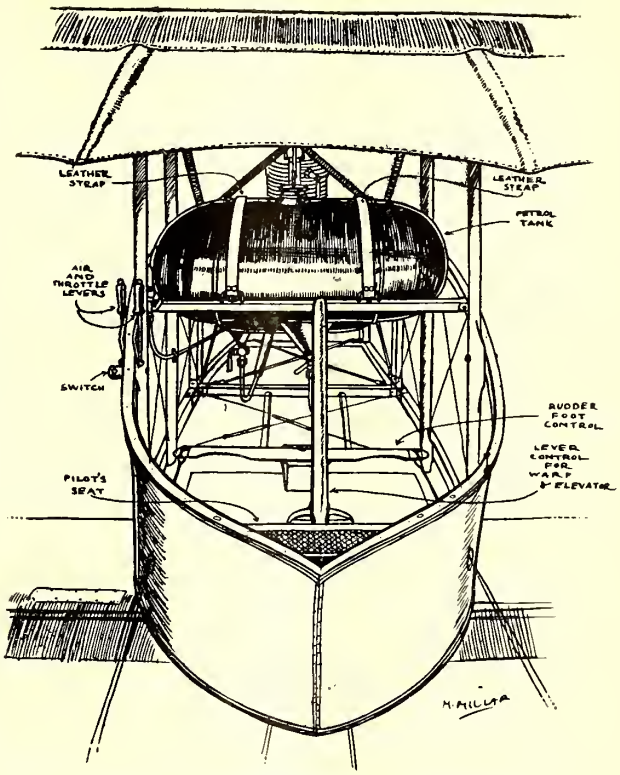
The Royal Aero Club.

At a meeting of the Committee on Tuesday, the 16th inst., the following new members were elected:—F. G. T. Dawson, A. Eveleigh A. Eagar, Edward Hotchkiss, Mrs. Longmore, Moss S. Myers, F. R. Samson, E. R. C. Scholefield, and J. S. V. Stephen.

The following Aviators' Certificates were granted: (201) Lieut. A. E. Burchardt Ashton (Bristol biplane, Salisbury); (202) Lieut. F. A. P. Williams-Freeman, R.N. (Bristol biplane, Salisbury); (203) Com. Oliver Schwann, R.N. (Bristol biplane, Salisbury); (204) Capt. P. W. L. Broke-Smith, R.E. (Bristol biplane, Brooklands); (205) Lieut. L. C. Rogers-Harrison (Bristol biplane, Salisbury); (206) Sub. Lieut. C. H. K. Edmonds, R.N. (Bristol biplane, Salisbury); (207) D. G. Young (Burgess-Wright biplane, Brooklands).

The request of the Aero Club de France for the Club to give its sanction to the issuing of an aviator's certificate to Mr. E. Scholefield was considered, and the necessary permission granted.

The Committee, after examining the certificates of the flights recorded in the Army and Navy competition, unanimously resolved that the prizes be awarded as follows: *Army*, £500—Lieut. B. H. Barrington-Kennett, Feb. 14th, 1912, on Nieuport, 50-h.p. Gnôme, at Salisbury Plain, 249½ miles; *Navy*, £500—Lieut. A. M. Longmore, R.N., March 11th, 1912, on Short tractor biplane, 70-h.p. Gnôme, at Eastchurch, 172 miles. A letter from Mr. A. Mortimer-Singer, the donor of the prizes, enclosing cheques amounting to £1,000, was received, and the chairman kindly promised to forward the prizes to the successful competitors. A unanimous vote of thanks was passed to Mr. A. Mortimer-Singer for his generous prizes, and also for his kind suggestion of a further prize for this year.



Seating arrangement of the Caudron.

Naval and Military Aviation.—The following letter has been addressed to all aviators: "Dear Sir,—You will doubtless have seen in the daily Press the announcement of the Government scheme for Naval and Military Aviation, copy of which I enclose for your perusal. The Committee of the Royal Aero Club is of opinion that this scheme should be carefully considered by aviators holding certificates, and also by those who contemplate taking their certificates with a view to offering their services subsequently to the Government. It is, therefore, proposed to hold a conference of those interested at the House of Commons, on Tuesday, April 30th, 1912, at 6.30 p.m., at which Col. Seely, the Under Secretary of State for War, has kindly promised to attend, when the whole subject can be thoroughly discussed. Should you desire to raise any questions as to the Government proposals, it will greatly facilitate the proceedings of the Conference if you will send in details, in writing, at the latest by Friday, the 26th inst., so as to permit of full information being obtained on the points to be raised.—Yours faithfully, C. D. Rose (Chairman), Harold E. Perrin (Secretary)." Members wishing to attend this Conference are requested to send their names to the Secretary.—Harold E. Perrin, Secretary.

Two views of the little Caudron at Hendon.

Aviation Honours at Rhyl.

Mr. Vivian Hewitt, who has been flying so well round about Rhyl, was entertained to dinner by the local Ratepayers' Association recently. This was the first public banquet to be held in Rhyl, and there were about 100 people present. Judging from the menu card, sent by The Aeroplane correspondent in Rhyl, the company did themselves and Mr. Hewitt uncommonly well. The toast of the guest of the evening was proposed by Councillor Phillips, who presented Mr. Hewitt with a large photograph of himself in a fine ebony frame, inscribed: "March 12th, 1912. Presented by the Rhyl Ratepayers' Association to Mr. Hewitt, Rhyl's First Aviator, in recognition of his brilliant flights. First flight in Rhyl, October 12th, 1911." It is only to be hoped that a similar spirit of encouragement for local aviators will spread throughout the country, and Rhyl is to be congratulated on having led the way.

Another Aviator Motorist.

As was noted recently Mr. Conway Jenkins and Mr. Harry Ferguson are to drive cars in the French Grand Prix, and it is now announced that Mr. James Valentine is to drive one of the Singer team in the same race. Whether motor manufacturers believe in aviation or not, they evidently believe in the eye and nerve of the aviators themselves.

Bargains for Builders.

People who are thinking of building experimental machines, or of starting a school, or even those who want spare stock, have several good opportunities just at present. As was noted last week, Mr. Handley Page has still a number of bargains among the stock of the Aeronautical Syndicate, Ltd., and that these are appreciated is shown by the sales already effected. The Gnôme-engined Valkyrie, Mr. Barker's favourite machine, has been sold for experiments in hydro-aeroplaning—or aquaplaning—in which it should be very successful. The Viking has been sold to go abroad. The little 35-h.p. Green-Valkyrie has also been sold for experiments. The 60-80 h.p. Green engine has gone, and the big Valkyrie to which it was fitted is for sale cheap. These sales have been so shrewdly accomplished that the rest of the stock can be sold at a very low price without serious financial loss to its present proprietor.

The Blondeau-Hewlett school are anxious to sell their two Farmans so as to make room for the building of some machines of more modern type, and as both machines are in splendid condition, as is only to be expected, having been always under the master hand of M. Blondeau, they would be most valuable for school work and passenger carrying.

The liquidators of the Universal Aviation Co., Ltd.—Messrs. Reeve, Parker and Co., of 2, Coleman Street, E.C.—have a couple of Gnôme engines, a Blériot two-seater, and various other machines, with tools and material, for sale cheap.

More bargains are among the stock of the Walton and Edwards Aeroplane Co. at Brooklands, which includes a brand new 100-h.p. Clergêt engine in beautiful order, and a quantity of material—wood, fabric, steel, tools, and so forth.

The Collyer-England Biplane.

Writing from Shoreham on the 18th, Mr. B. H. England says:—"I am glad to say we have now got our machine to fly splendidly with the 30-h.p. Green engine, and have got a pupil almost ready for his ticket. I had a 'discontinuation' a few days ago through a bumpy landing in a side wind, and am seizing the opportunity to completely overhaul the machine and recover the planes.

"You will note that our tuition fees are exceptionally low, and also that we share the damage with pupil, thus reducing the pupil's smash bill by 50 per cent.

"I might add that our 'bus has shown considerable constructional strength, each wing tip having sustained a landing without any further damage than a few broken wires.

"Wishing The Aeroplane all success."

Good work at Filey.

Writing from Filey on the 18th, Mr. A. J. de Villiers, who has recently joined the Blackburn. School there, says:—"I found the machines here in perfect trim, and the Blackburn people have secured a good man in Brereton, for until Saturday last (13th) he had never had a chance of proving himself, owing to four months of continual gales. His flight on Sunday last was magnificent. His engine was missing badly, and he only kept the machine up by diving, often within three feet of the water. The Gnôme-Blackburn is very slow after the Isaacson. Although both engines are rated at 50 h.p., I am sure the Isaacson fully develops this and a little over. She is in splendid condition now, and runs well for long periods without overheating.

"I find the machine itself is child's play to fly after the Blériot-Anzani, and I also find the speed difference difficult to get into. She does about 60, because she is now fitted with racing planes. When once you are up, you have only to hold the control and look at things passing. Landing is easy and requires no judgment, as one has a clear view all round."

A Desirable Addition to British Aviation.

An extremely important move in connection with the manufacture of British aeroplanes has just been made, for by the time these notes appear the British Hanriot Company will have been registered, with Mr. Maurice Ducrocq as general manager.

It has often been regretted in The Aeroplane that more has not been seen in this country of the Hanriot machine, which, although it has not taken part in the big French competitions, is certainly one of the finest machines on the Continent; and it will be remembered that the very early type Hanriot, which has been at Brooklands since Autumn, 1910, has always flown excellently whenever the engine has been in decent order, and a number of the very best pilots have been trained on it.

The latest type of Hanriot is, however, a very different machine, and at first sight might be taken for a Nieuport. On investigation, however, one finds that it is an absolutely different type in every way, the body being wider and deeper, so the pilot and passenger sit side by side, and are so placed that they have an excellent view. The wings also are of quite a different shape. The chassis is different, and the controls are of standard type.

It is stated quite definitely that for the same power the machine is considerably faster than the Nieuport, so it should in every way fulfil the requirements of the Royal Flying Corps.

Mr. Ducrocq hopes to have a French-built demonstration single-seater at Brooklands in the course of a week or so; but future machines will be built in this country, and may therefore be classed among British-built machines which may be acquired by the Flying Corps. As a matter of fact, an order for the construction of a British-built two-seater has already been placed with the Blondeau-Hewlett firm, so that it will be built by British workmen in this country.

One may confidently expect the machine to be a success, for Mr. Blondeau is one of the soundest men connected with aviation, and, whatever may be one's opinions as to the merits and demerits of the box-kite type of machine, there is no doubt that the Farmans built by him at Brooklands have been unsurpassed for soundness of workmanship. It may be well to note that the Blondeau-Hewlett firm are in no way connected with the new Hanriot Company, but the order has been placed with them simply because Mr. Ducrocq and M. Hanriot himself have absolute faith in anything turned out by Mr. Blondeau. It is to be hoped that the new firm will meet with every success, for the machine is thoroughly good, and Mr. Ducrocq is one of the men who have done most in this country to inspire confidence in aeroplanes and their capabilities.

His Majesty's Airboats.

His Britannic Majesty's airboats—one really cannot take them seriously and call them airships—*Beta* and *Gamma*, have been distinguishing themselves of late, thanks to the nice calm mornings. On Thursday last they were both out for quite a while, the *Gamma* cruising to the north-east, and the *Beta* going down into Hampshire, where the engine stopped and the poor little thing had to stop so long in the air that she lost a great deal of gas, and her poor little nose blew in when she tried to get going again. However, Capt. Maitland's luck held, and he got down without injury.

But it was Monday morning which beheld the full glory of the *Gamma*. In charge of Capt. Maitland and Lieut. Waterlow, R.E., she actually arrived in London and circled the dome of St. Paul's, that Mecca of all good dirigibles. The London dailies cheerfully ignore the fact that anything from 50 to 100 miles flying per day is the regular routine of an aeroplane school pilot—Mr. Pizey reckons 75 miles a fair day's work on his Bristol, and Mr. Lewis Turner carried 14 passengers about 6 miles each on the Grahame-White biplane last Sunday—but they waxed absolutely lyric over the *Gamma*. The *Pall Mall Gazette*—presumably in the absence of Mr. C. C. Turner (Certificated Aviator)—burst forth on Monday with "There was a radiant spectacle for those who were early astir in town this morning. By half-past eight the *Gamma* had circled St. Paul's Cathedral at a thousand feet in air . . . the great dirigible flashed upon the sight as a creature of pure sunshine, a vision of flawless white [the *Standard* said it was yellow] against a sky of almost Italian blue. . . . She is a

daring re-assertion of the claims of the lighter-than-air-ship, and she did quite enough this morning to indicate her possibilities as a scout in time of war."

To use an expressive Americanism, "Come down off the organ!" "Scout in time of war," forsooth! If she can be coaxed out of her shed in anything but a flat calm, let the *Gamma* come over to Brooklands in a puffy breeze such as was blowing on Sunday last, and show us what she can do in the way of manœuvring against, say, Mr. Sabelli on the little baby Deperdussin, let alone Mr. Sopwith on the big Blériot, or Mr. Valentine on a Bristol two-seater.

When the Royal Aircraft Factory has produced a dirigible able to do 60 miles an hour and manœuvre accurately in a 35-m.p.h. wind, then we can *begin* to talk about "the claims of the lighter-than-air-ship." Meanwhile aviators want to know why a semi-dirigible, which may burst at any moment, which is absolutely out of control if its engine stops, and which has every facility for dropping spanners and petrol cans overboard, is allowed to conduct its evolutions right over a crowded city at a height of about 300 ft., when trouble is raised if an aviator dare to fly along the line of the Thames despite the fact that his machine is faster, safer, and is under perfect control if the engine stops.

However, the triumph of the airboats was quite short lived, for, on Monday also, the poor little *Beta*, evidently wishing to emulate the late lamented *Lebaudy*, scratched her little side against the shed and burst, and, in the pathetic words of the dailies, "will not be fit for service for some time."

The Gilmour Memorial Fund.

The Gilmour Memorial Fund continues to make satisfactory progress, as will be seen from the figures given below.

As it will soon be necessary to close the fund, it is hoped that those who wish to send subscriptions will let one or other of the following gentlemen have them as soon as possible:—Mr. Harold Perrin, Secretary of the Royal Aero Club; Mr. T. O'B. Hubbard, Secretary of the Aeronautical Society; Mr. T. W. Staplee Firth, c/o Firth and Co., 77, Chancery Lane, W.C.; Mr. Harry DelaCombe, Royal Aero Club; or to Mr. Eric Clift, 51, Sinclair Road, S.W. Or they may be sent to C. G. Grey, at this office. Mrs. Handasyde has this week collected £5 3s. at Brooklands:—

	£	s.	d.
Amount already acknowledged:—	166	15	6
Mrs. Moorhouse; C. R. Abbott; H. J. D. Astley; Capt. G. W. Dawes—£1 1s. each (4) ...	4	4	0
R. Hensleigh Walter		10	6
Ernest T. Trier		10	0
Arthur W. Tate; K. S. Aplin; R. S.—5s. each (3)		15	0
N. P. L.; R. Kirke—3s. each (2)		6	0
M. Hensleigh Walter; G. M.; H. Lewis; T. Lewis; J. Chater-Lea; P. F. D.; L. M. G.; V. H.; B. F.; T. U. Skeffington; 2s. 6d. each (10)	1	5	0
W. R.; H. S. S.; J. G.; B. R. Waite; Mrs. F. Waite; J. F. F.; H. Pike Pease; Lieut. H. E. Rendall; W. H. Randall; M.—2s. each (10)...	1	0	0
M. Reilly		1	6
Eric H. Walter; Stanley H. Walter; J. M.; A. V. S.; "Ugly"; F. W.; J. W.; C. F. S.; M. R.; W. Gale—1s. each (10)		10	0
M. Reilly			6
Total ...	£175	18	0

More Prophets Without Honour.

The *Daily Mail's* Berlin correspondent quotes, with an air of wonderment, the statement from German papers that the "greatest aeroplane factory in the world" is to begin at Johannisthal, and concludes: "It will be known as the Albatros Flying Machine Company, and its works will have a capacity of between 10 and 12 machines a month."

Apart from the fact that the Albatros Company has been building successful machines for nearly two years, the *Mail* happily ignores the fact that the Bristol Company's works, even as they are now without expansion could easily turn out 10 machines a *week* if the demand existed, and that they have already built close on 100 machines in the past 12 or 15 months, which is not so far short of the German prodigy about to be. As to the output of Vickers, Ltd., and the Coventry Ordnance Works, if the need arose, one would have to reckon their output in thousands per annum.

A New "Dope."

The writer has just experienced one of those sudden shocks which occasionally shake to their No. 10 foundations even the best and heaviest of mortals. He has been privileged to examine some samples of a varnish for aeroplane work which shows a series of mutually incompatible features.

Firstly, the "dope" is a dark brown transparent liquid which smells very much like an ordinary oil varnish. Now, a varnish of this kind is usually avoided, because fabric treated with it usually becomes as brittle as paper. In this case, however, Egyptian cotton and Jap silk both remain absolutely flexible, *and retain their full tensile strain.* A single coating, applied on one side, penetrates the fabric, making both sides proof against the following varied list of reagents:—Sunlight, heat, cold, acids, water, soap, petrol, benzine, ammonia, and other strong alkalis. It leaves the fabric as it was with regard to inflammability, and does not shrink it. Not only this, but it imparts its virtues to other substances. If, for example, planes are required to have a glazed finish, the first coat is composed of "Flexible Compound" alone, and the second, half "Flexible Compound" and half of any desired varnish. As a test of this property, a piece of tinplate was shown, with a coating, about 1.40 in. thick, of Portland cement mixed with "Flexible Compound" instead of water. This plate was bent in a circle of 1 in. diameter, the cement coating adhering perfectly, and showing no cracks.

A companion product, in the form of flexible black enamel, survived two interesting tests. A piece of sheet iron, coated on both sides, was left in strong sulphuric acid, which completely dissolved the metal, leaving the two coats of enamel untouched. Another piece was repeatedly bent double till the metal fractured, leaving the enamel uninjured.

It only remains to add that the quantity of "compound" used is similar to that of ordinary varnish, and that it costs less than half as much as some of the special aeroplane varnishes in use at present.—P. K. T.

A Promising Engine.

While at Brooklands recently the writer had the opportunity of examining thoroughly the new A.B.C. engines now in the course of construction, and if these fulfil their promise on paper and in the rough they should go far to remove official prejudices against British aeroplane engines.

While in general appearance they do not suggest any sensational novelty, there is an enormous amount of clever detail design, and weight has been reduced to a wonderful extent, without, so far as one can judge, sacrificing the strength of any part which is called upon to stand heavy strains.

The new 8-cylinder 120 h.p. engine introduces an entirely new system of crank case arrangement by using a cylindrical case, on which the cylinders are mounted with their feet cast and machined to the arc of a circle, and it is proposed in future to make this case of steel instead of aluminium, when it is expected that it will be both stronger and lighter. As the 120 h.p. is calculated to come out at about 280 lbs., the appearance of the first of the new engines will be of more than usual interest.

Mr. Ronald Charteris, and his chief designer, Mr. Granville Bradshaw, have worked very hard for success, and it is to be hoped that they will soon reap their reward.

Hendon's Next Meeting.

The Aeroplane has been favoured with an advance programme of the Second Spring Meeting at the London Aerodrome, which is to be held on the second anniversary of the great London-Manchester flight, when Mr. Grahame-White made such a plucky attempt to win the *Daily Mail's* prize.

The following races will be flown on Saturday next, April 27th (weather permitting):—

Event No. 1. 3.0 p.m. to 3.45 p.m. Monoplane Handicap Speed Contest. (The entrant of the winner to receive trophy value 25 gns., and the entrant of second 10 sovs.) Open to all types of monoplanes. Eight laps. Distance about 12 miles.

Event No. 2. 3.45 p.m. to 4.45 p.m. Relay Race. (The entrants of the winners to receive two silver trophies, and the entrants of the second pair £5 each.) Open to all types of aeroplanes, four laps. To be competed for in pairs, biplane and monoplane.

Event No. 3. 4.45 p.m. to 5.30 p.m. Cross-Country Handicap (about 10 miles out and 10 miles back). (The entrant of the winner to receive trophy value 25 gns., and the entrant of the second 10 sovs.) Open to all types of aeroplanes. Competitors' aeroplanes to be on the starting line with engine running and to start on the fall of the starter's flag, to fly round the mark, which will be indicated to each competitor an hour before the race, returning and crossing the starting line. The winner to be the entrant of the aeroplane returning and crossing the starting line first, having properly completed the course.

Event No. 4.—5.30 p.m. to 6.15 p.m. Altitude Contest. For the St. Ivel Challenge Trophy, value 50 gns., to be won three times by the competitor before becoming his absolute property.

The New Martin-Handasyde.

Messrs. Martin and Handasyde have now almost completed a new machine which appears a magnificent piece of work. The fuselage of the machine is practically the same as the old one, which proved itself so enormously strong in the accident which resulted in the death of poor Mr. Gilmour. The wings, however, are built on an entirely new principle, the spars being of box section built with two stout ash longitudinals top and bottom, which are connected by three-ply wood. Exhaustive tests have shown that a spar built on this principle is at least twice as strong as a solid spar in the same section, and the massive structure of the whole wing should be enough to give one complete confidence in it.

In the case of the new spars, stout ash beams built into the fuselage fit inside the box of the spar itself, and these beams cannot possibly leave their places without the fuselage itself disintegrating. The machine should be making its first trials in the course of the next two or three weeks.

A Trustworthy Record.

Few, if any, schools in England, or in any other country, can show such an excellent record as the Hewlett-Blondeau school at Brooklands, which has good claim to be the only school which has never had a smash, or even damaged an aeroplane, in the course of its work. The school also has several points which are worthy of note. It was the first properly established school to be opened in England. It was the first school to pass an Army officer for his certificate—Lieutenant T. Snowden Smith, A.S.C., who is certainly one of the best fliers in the country, having been trained there soon after the school was opened, all previous Army pilots having learnt on their own account, without school training.

The school has had particular success with Service pupils, having also trained Lieutenant Cecil Marks of the Middlesex Regiment and Lieutenant T. G. Hetherington of the 18th Hussars, also Lieutenant Spencer Grey, R.N., and Lieutenant F. E. T. Hewlett, R.N. The last-named pupil won his certificate after only two lessons from M. Blondeau, and this in itself constitutes another record for a school-trained pupil. Further, the school was the first to pass a British woman pilot for her certificate, that honour belonging to Mrs. Hewlett.

M. Blondeau, the instructor, is acknowledged to be one of the finest biplane fliers here or elsewhere; for, although he has never distinguished himself by big cross-country performances, he undoubtedly handles his machine to perfection, and has a wonderful knack of turning out pilots with a thoroughly good knowledge of their machine

A World-Wide Business.

Messrs. Mann and Grimmer have recently taken new premises at Kingston, where they have ample space to go ahead with full-size work as well as the models which have become so popular. They are considerably augmenting their staff of workers, so that they will be able to supply their rapidly increasing orders for models more quickly than ever, as well as doing experimental work. When Messrs. Mann and Grimmer called on The Aeroplane recently they showed us letters from such diverse parts of the world as Copenhagen, Winnipeg, Johannesburg, Pretoria, Malta, Rhodesia, British Guiana and Switzerland, and said that they have at present a large order for models in hand for Siam, so that evidently their business is becoming world-wide. They are of the opinion that there is far more interest taken in models abroad than in Great Britain, as is similarly the case with full-size machines.

More Model Accessories.

The Weston Hurlin Co., who are well known as supplying a large variety of models and accessories, as well as full-sized machines and accessories, have just issued a new catalogue for 1912.

Their models range from toy hundred-yard machines, at 3s. or so, to serious models, good for five or six hundred yards—even the latter, however, being very cheap. Their propellers are also cheap, especially in consideration of the fact that they are carved, and not bent, as are most cheap propellers. The other accessories are more or less as usual, except that the variety is greater than that offered by most firms.

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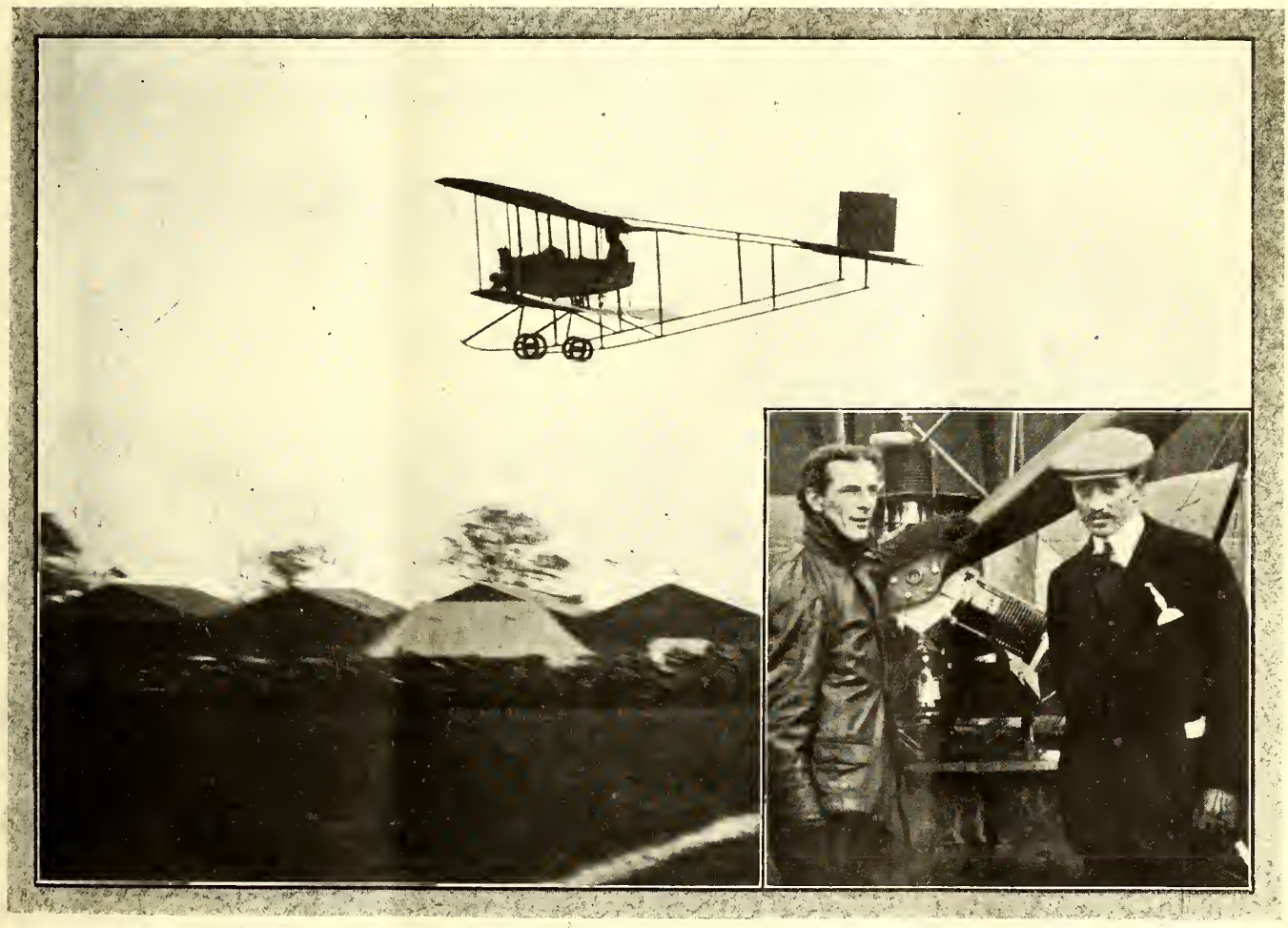
1d WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

VOL. II. [Registered at the G.P.O. as a Newspaper.] THURSDAY, MAY 2, 1912. No. 48.

THE NEWCOMER.



Mr. W. H. Ewen on the little Caudron Biplane flying at Hendon. Inset are Mr. Ewen, on the left, and M. René Caudron, the designer and builder of the machine.

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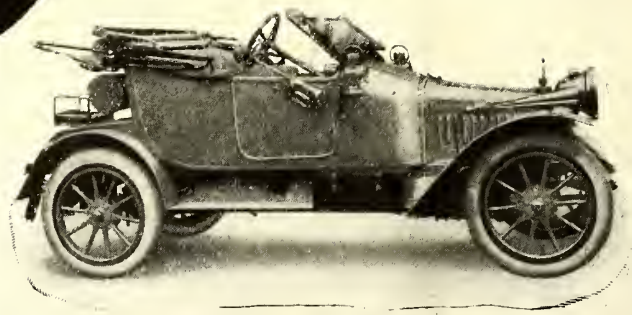

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Editorial and Advertising Office—166, Piccadilly. Telephone—5407 Mayfair. Telegrams—Ailfron, London.

MATTERS OF MOMENT.

COMMON SENSE AND HYDRO-AEROPLANES.

It is not without interest to see that various publications, including certain technical journals, are at last awakening to the value of hydro-aeroplanes, and are beginning to point out, as The Aeroplane has already done for a considerable time, that the hydro-aeroplane has every probability of becoming quite a popular form of amusement.

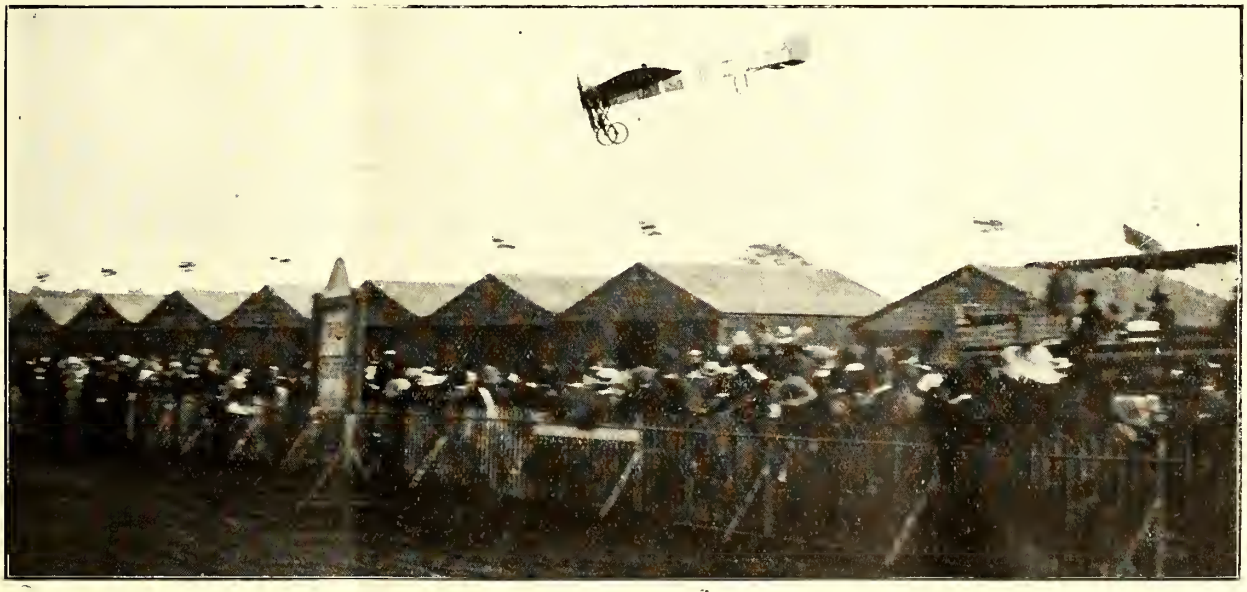
The average technical journal, though frequently quite knowledgeable, is generally without pronounced opinions, and it is, therefore, refreshing to see at least one journal of this type boldly advocating that aviators, or constructors, who possess or who can build hydro-aeroplanes, should take them down to seaside resorts in the summer and proceed to make a fortune therefrom. While cordially agreeing with the possibilities of financial success on these lines, it may, however, be well to point out that a good deal of caution should be exercised in selecting the type of machine it is intended to use as a passenger-carrying pleasure vehicle.

Accidents will happen in the best regulated families, and the type of accident which is most likely to happen with a hydro-aeroplane is a header following a bad alighting. Now a man who is a really fine swimmer may be able, with luck, to extricate himself from a mass of wires some ten or twelve feet under water, and come to the surface again, but the ordinary paying passenger cannot be relied upon to evolute under water with quite the certainty of an otter.

Though both Fischer and Renaux at the Monaco Meeting succeeded in carrying numerous passengers without accident, it may be well to remember that it was more by luck than judgment that M. Séguin, of the Gnôme Company, and another passenger were not drowned when the Voisin-Canard executed its submarine "discontinuation," and, therefore, the box-kite type of machine, in which pilot and passenger are in front of all the power-plant and complicated wiring, is by no means suitable for an ordinary passenger service, for a few deaths by drowning would detract from the popularity of the new pastime.

Mr. Sippe's experiences with the Avro and Mr. Kemp's tests with the Gnosspelius hydro-monoplane have shown that the engine-in-front type can be quite as successful as the box-kite, and a machine of this type taking an involuntary header into the sea would naturally float the passengers out as it went under water itself, especially if, in the case of a biplane, an emergency exit was made in the back of the upper plane, as one clever designer has already arranged.

If one has got to go out in an aeroplane accident, and is determined to do so on a box-kite, one good clean smash on solid ground is certainly a more pleasant way of doing it than being held down under a mass of wires, and drowned like a rat in a trap. The box-kite may possibly have some advantages, if viewed sufficiently long with the eye of faith, but certainly its advantages do not obtrude themselves when passenger hydro-aeroplaning is under consideration.



An Undesirable Practice:—Mr. Hamel coming in over the enclosure after his fine cross country flight from Hendon to Brentford and back in the gale last Saturday.

Casual Notes at Eastchurch.

Eastchurch is getting busier and busier, and the Short Brothers' premises are rapidly evolving from a workshop into a regular factory. There is plenty of work in hand, and the chief trouble at the present moment seems to be that it is difficult to get really good workmen who are fit to do the high-class work upon which the Short Bros. insist, and who are at the same time willing to do that work so far away from London. If some of the workmen who grumble so much about the difficulty of getting work would only realise the healthiness of the conditions under which work is done at Eastchurch, and the good it would do them to have a comfortable six-mile bicycle ride from Sheerness to Eastchurch and back every day, there ought to be a real rush to get jobs at the factory.

A great deal of the work now in hand at the Short Bros.' factory is purely for Government purposes, and, therefore, the writer is not at liberty to indicate precisely what is being done; suffice it to say that those critics who are so fond of decrying British design and ability are likely to receive something of a shock when some of the latest Short products "take the air," or the water, as the case may be.

Apart from the Short factory, some most interesting experiments have been tried by Mr. Alec Ogilvie, who has placed the N.E.C. engine of one of his Wrights in front of the machine, and connected it by a shaft to the former gearing, boxing the whole arrangement into a very effective but somewhat quaint looking streamlined body, which at a distance gives one the impression that a very large and fat duck has taken a seat on the lower plane. However, the writer can vouch from experience for the fact that the passenger's position inside the body of the said duck is very much more comfortable and sheltered than it is when sitting on the front edge of nothing.

Mr. Ogilvie has already flown the machine for about an hour in the course of four or five flights, and it behaves exceedingly well, being rather faster than it was before, and more pleasant to fly, but at present certain little adjustments are required, so he does not consider it quite a finished product as yet. At any rate, he has the credit of being the first in this country to fly a machine with the engine in front and propeller behind, and he is probably the first anywhere to fly a machine with the engine in front and twin propellers—a type which is quite likely to become very popular for military work, as it affords a perfectly clear field of fire in front, and a sufficiently clear space behind and on each side.

Another interesting product is the Short biplane which the Hon. Maurice Egerton has been flying so well all through the winter, and has now had fitted as a triple twin, that is to say, twin tractors in front and a single propeller behind.

During the last few weeks, while the wind has been so bad, Mr. Ogilvie has had out his old Clarke glider, built on the Wright pattern, and has altered it by making it into the shape of a modern Wright machine by abolishing the front elevators and putting on an elevator tail. He and Mr. Maurice Wright have been doing quite a good deal of gliding with it.

Rather a quaint production is at present under construction by Major Brocklehurst. This machine is a monoplane of sorts with wings apparently founded on the idea of those of a bat.

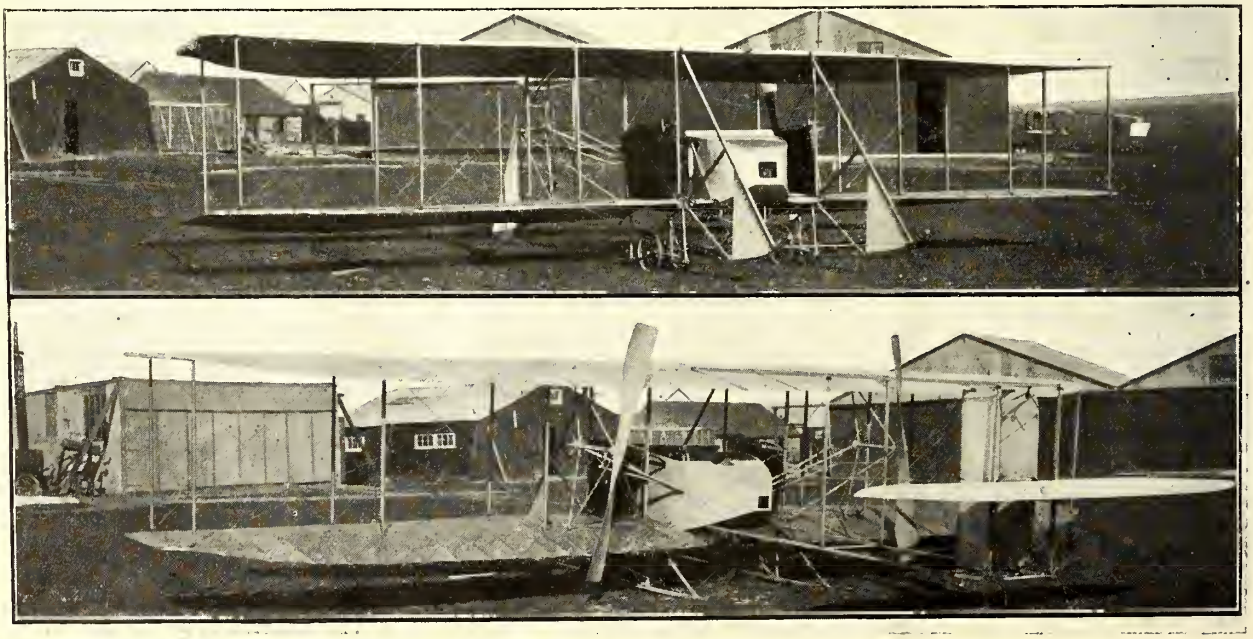
Altogether Eastchurch is very busy, and is beginning to look extremely prosperous, and the naval element is having an excellent effect, the way in which the bluejackets handle machines being absolutely startling to anyone used to the dawdling way shed-doors and machines are moved at the ordinary aerodrome.

The Troubles of a Constructor.

Those who believe that British engine makers are the only people who ever make mistakes will be interested to know of the experiences of a certain British constructor who recently bought an engine much in favour with the Flying Corps authorities. When delivered he found that the boss supplied for the propeller did not fit the propeller shaft. He wrote to the English representatives of the firm, and was told, "With regard to the propeller bosses, we do not fit these, and should suggest that the people who are making the propeller are in a better position to do this than we ourselves." The constructor replied, "The trouble with the propeller bosses is that they do not fit the shaft on the engine. It is not usual to ask the carpenter who makes the propeller to alter the engine." And now the English agent is furiously thinking.

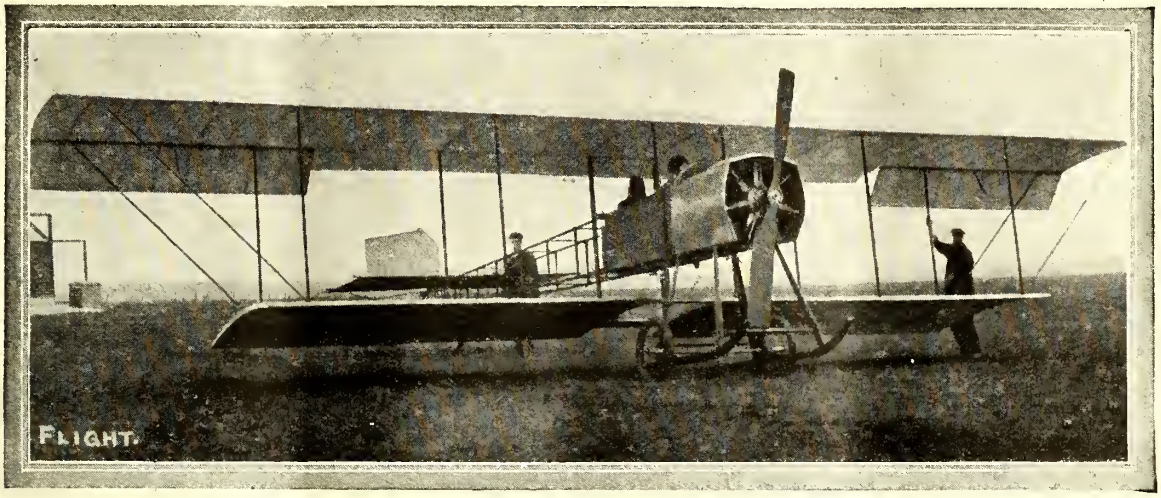
The Rolls Memorial Unveiled.

The Duke of Argyll unveiled on Saturday the statue of the late Hon. C. S. Rolls, which has been erected on Dover sea front to commemorate the double Channel flight which he made in June, 1910. The company present included Lady Llangattock (Mr. Rolls' mother), Lady Hood of Avalon, Sir John and the Hon. Lady Shelley, Sir Fitzroy Maclean, Mrs. R. F. Scott, Major-General Ruck, R.E., Colonel Capper, R.E., Sir W. Crundall, Mr. Burkett, Major-General Inglefield, Commander Forster, R.N., Mr. Harold Perrin, Mr. Walter Emden (ex-Mayor of Dover), Captain Marley, and members of the Corporation. After the unveiling ceremony, performed by his Grace, the Deputy Mayor, on behalf of the town, and Sir W. Crundall, representing the Harbour Board, accepted the statue, with promises to maintain it. Lady Llangattock placed a beautiful wreath of laurel and lilies on the base of the monument. It will be remembered that this statue, which is one of the most startling likenesses ever produced by a sculptor, is the work of Mrs. R. F. Scott, the wife of the Antarctic explorer, who is herself a keen student of aviation and has done a great deal of flying. Dover is to be congratulated on possessing the finest monument yet erected in connection with aviation.



Mr. Ogilvie's Wright, with the N.E.C. engine in front under a streamline cowl, driving a shaft to the propellers in the usual position. This arrangement of engine and propellers is likely to be popular for military purposes.

CONTRACTORS TO THE ADMIRALTY.



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PASSENGER FLIGHTS IN MONOPLANE OR BIPLANE.

Notes on the Official Memorandum.—*(Continued.)*

BY W. E. de B. WHITTAKER.

The Selection of Machines.

The question of *matériel* is of equal importance to that of *personnel*. The greatest courage and the highest efficiency are of little avail if the implements in use are obsolete and dangerous.

Because the rifle issued to the British Army is not equal in design and in the results obtained to those of foreign armies there is no particular reason why a similar principle should regulate the purchase of aeroplanes for the use of the Royal Flying Corps. Again, the fact of a manufacturer having persevered in the building of aeroplanes for several years under great difficulties constitutes no reason for the granting of a Government contract to him unless his designs are of the approved standard. Perseverance without talent is obstinacy.

The Memorandum announces that "Steps have already been taken for the purchase of twenty-five aeroplanes for the Central Flying School, and deliveries will commence as from April 30th, 1912. The makers have been called upon to meet all necessary requirements." The clause dealing with the naval wing is different in form and in effect. "Steps have been taken for the purchase of twelve aeroplanes, hydro-aeroplanes, and floats for first requirements. In selecting the types for purchase it has been deemed desirable to test a number of types with a view to arriving at the most suitable pattern for naval service. As soon as a satisfactory type of aeroplane for future use has been evolved, orders will be given so as to ensure that there are always not less than two machines of the same type available." Nothing is stated as to the selection of machines for the military wing.

In the selection of aeroplanes our practice ought to differ considerably from that of our model, France. The different official statements on the Flying Corps are all in agreement on one point at least—that the corps is not to be of large size for some time to come. As the hand of War is not stayed to allow a nation to become prepared, our flying arm, if small, should be relatively as completely efficient as it would be if on a very much larger scale. Each type differs as much in its uses as in its appearance. It is therefore important that in the issuing of orders the distinct advantages of each machine should be thoughtfully considered. In France the army has, by the enthusiasm of the people and the generosity of the Ministry, been able to purchase aeroplanes by the hundred, instead of singly. Consequently, all the requirements of the different *escadrilles* can be supplied from the great number of machines in the possession of the army.

Varying Attributes for Varying Purposes.

In England, as the number is low, each aeroplane becomes of great importance, and it is of importance that the numbers acquired from the different constructors should bear some pre-arranged relation to each other. The Nieuport, Blériot, Deperdussin, Flanders, and Bristol are all monoplanes, and yet, though all of the first class, their virtues are not identical. The country over which flights are to be made alters the selection of machines according to its surface, etc. It is obvious from this that, if a squadron consists of, say, six monoplanes and six biplanes (this is purely for the sake of argument), it is not necessarily wise practice to allot six Nieuports to that squadron simply because they are monoplanes. The types should be divided according to their attributes.

And so, in the initial purchases, the numbers supplied by different makers should be regulated by commonsense and the needs of the Army. The selection at present seems to follow no rule but that of caprice and a desire to placate certain sections of public opinion.

Public opinion and efficiency are rarely the same thing. The public is invariably greatly in favour of complicated locks after the departure of the valued animal, and it is the official who should make for security in the first case.

The great rulers of the world have not attained their success by servile seeking after popularity. A strong man and a definite line of action is sorely needed at the present time. Such orders as are common knowledge vary in a bewildering fashion, and it would appear that individual preferences have entered rather largely into the question. The greater part of the orders are for monoplanes, all two-seaters, and many of them of a type not particularly suitable for the flying conditions of this country. It is true that a war of which this country would be the field is unlikely; but, on the other hand, even the suave courtesy of foreign nations would hardly extend to us the privilege of practising evolutions on their lands with our Flying Corps. There are limits past which friendship does not go. This being so, it is surely wisdom to order aeroplanes most suitable for the conditions under which they will fly.

Transport.

Transport, a matter which had apparently been forgotten, is mentioned briefly in the Memorandum, as follows: "War transport will be required for each flight on its establishment." In another place the necessity is pointed out of attaching at once "complete war transport for two flights of aeroplanes" to the Central Flying School.

It has been definitely decided that, for the present at least, the aeroplane squadron shall consist of twelve aeroplanes, with a *personnel* of 153 officers and men. Adequate transport for such squadrons is a difficult matter to arrange. The amount of road space occupied is of great importance, and yet the desire for compactness must not interfere in any way with the mobility of the squadron as a whole.

In the Special Army Order issued on April 15th regulating the establishment of the Royal Flying Corps it is stated that the first line transport for each squadron shall be thirty-one motor-vehicles, consisting of seven motor-cars, nine 30-cwt. lorries, three repair lorries, six shed lorries, and six trailer trucks to hangar lorries. Six motor-cycles are attached and one 30-cwt. motor-lorry for baggage and supplies.

One cannot gather from the tables in the Army Order the exact uses to which these motor-carriages are to be put. A few weeks ago in these pages I suggested a form of transport for a squadron of six aeroplanes. In that case I calculated that ten motor-vehicles would be required, occupying in all 140 yards of road. Taking the same proportion of road space occupied (a moderate one), the thirty-one vehicles of the official squadron would cover about 434 yards—roughly, a quarter of a mile. Greater compression of the space between vehicles would considerably reduce the rate of march. A reduction in the number of vehicles would, on the other hand, accelerate the pace. It must, of couse, be remembered that any great acceleration of speed on the march is unnecessary, as the rate of progression is regulated by the slowest moving body of the troops, and not the fastest. The tendency of the age is towards increased mobility and speed. But the speed is required after joining battle more than any other time.

The difference of figures between the plan mentioned in these pages and the official intentions is, apparently, due to the fact that I made no provision for the conveyance of portable hangars, whilst the words "shed lorries" in the Army Order may mean such conveyance. I am in doubt as to whether the use of hangars will be necessary in the field. As time goes on and methods of construction improve, the aeroplane is becoming less and less fragile. Sufficient protection against adverse weather can be obtained by using tarpaulin covers if it is neces-

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sary for the aeroplane to be ready for immediate service. When on the march the machines will be securely packed on their respective lorries.

Why six motor-bicycles should be attached to the squadron is not explained. The motor-bicycle is restricted to use on ordinary roads to exactly the same degree as the car. It has the advantage that, if it is necessary to send anyone to the rear of a column on the march, the bicycle occupies less space on the already congested road than does a car. But why as many as six?

Transport is of increasing importance in the economy of modern armies. Increase in the number of effective troops employed also adds greatly to the difficulties of moving both troops and supplies to any given point without confusion or congestion or without spreading the army employed over too large an area. It is, therefore, not enough to arrange adequately for the conveyance of aeroplanes. Considerations of space must rule any arrangements so long as the efficiency of the *matériel* conveyed is not affected. It does not seem that those responsible for the organisation of the Royal Flying Corps have borne this in mind to a sufficient extent.

(To be continued.)

The Royal Flying Corps.

The following are the chief points in the special Army Order issued by the War Office, and dated April 23rd, 1912, containing the Royal Warrant dealing with the pay of the Royal Flying Corps (Military Wing):—

(1) Officers appointed to serve in the military wing of the Royal Flying Corps (other than the Commanding Officer) shall, from the date of such appointment, be graded and receive pay as follows:—Daily ordinary pay: Squadron commander, 25s.; Flight commander, 17s.; Flying officer, 12s. Daily flying pay, 8s.

Flying pay may be issued during leave on the same conditions as staff pay. Subject to this, flying pay may be issued continuously to officers serving in the aeroplane squadrons and to officers who are qualified aeroplane flyers serving in the airship and kite squadron. Officers serving in the airship and kite squadron who are not qualified aeroplane flyers shall receive flying pay at the above rate for each day on which they make an ascent by airship or kite.

(2) The pay of other officers shall be as follows:—Commanding officer, military wing, £800 a year, with quarters; medical officer, pay and allowances of his rank.

If the medical officer is required to fly, the Army Council shall decide what emoluments he shall receive with reference to the special circumstances of the case.

(3) The pay of the Staff of the Central Flying School shall be as follows:—Commandant, £1,200 a year, with quarters; Instructor, the emoluments laid down for a squadron commander in Article 1; Quartermaster, as laid down in Article 138 of the Pay Warrant.

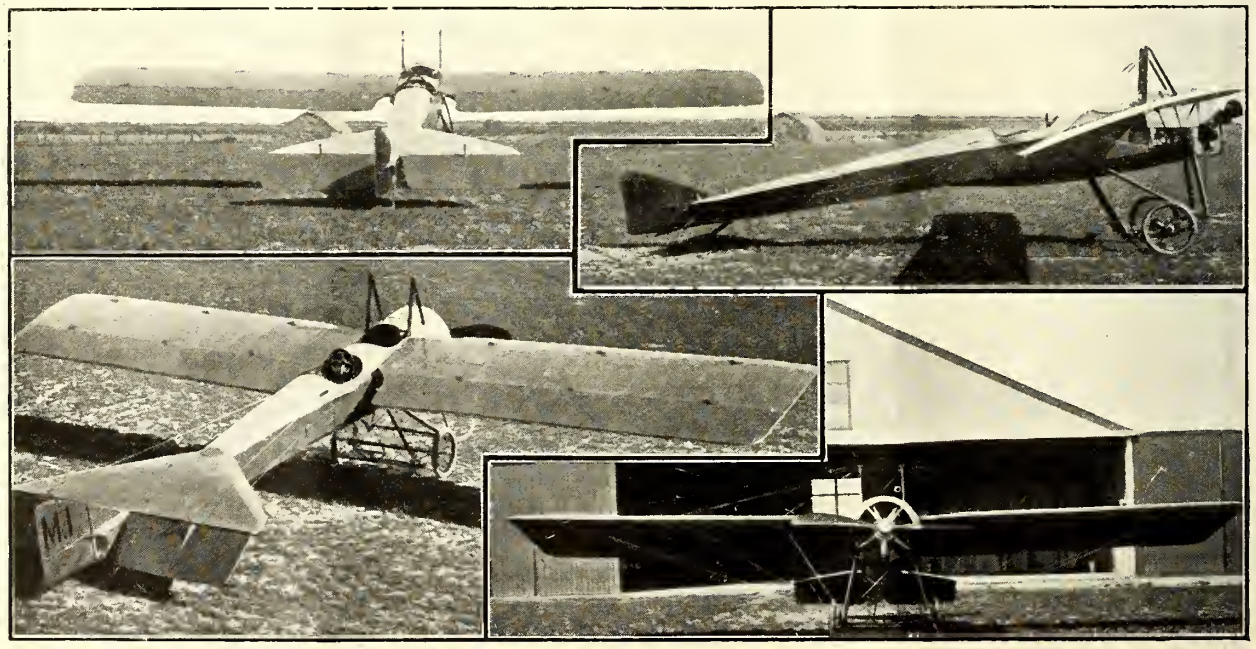
(4) Officers shall be seconded for service in the Royal Flying Corps from the date they satisfactorily complete such period of instruction at the Central Flying School as the Army Council may prescribe. Whilst undergoing this period of instruction, they shall receive the regimental emoluments of which they were previously in receipt, and shall in addition receive flying pay at the rate of 4s. a day.

(5) The period of an officer's service in the Royal Flying Corps shall, subject to his remaining fit for flying duties, be four years, but it may be prolonged at the discretion of the Army Council.

(6) Officers appointed from civil life to the Special Reserve of Officers for service in the Royal Flying Corps shall, whilst under instruction at the Central Flying School, be considered as on probation, and shall receive regimental pay at the rates appointed for infantry officers of the Special Reserve of Officers, together with flying pay at the rate laid down in Article 4. Their period of service shall be as laid down in Article 5. On the satisfactory completion of the period of instruction prescribed by the Army Council, their commissions may be confirmed, and they shall then be graded as flying officers. They shall thereafter be eligible to receive, while employed on flying duties, the emoluments laid down in Article 1, except when performing the quarterly flying test referred to in Articles 7 and 8. They shall also be eligible to receive an outfit allowance of £40 under the conditions prescribed for other officers of the Special Reserve of Officers.

(7) Officers who are not serving continuously in the Royal Flying Corps shall form the Reserve of the Royal Flying Corps. The officers of this Reserve shall consist of two classes. Officers of the First Reserve shall be required to perform a quarterly flying test to be prescribed by the Army Council. Officers who do not perform a quarterly flying test shall form the Second Reserve of the Royal Flying Corps.

(8) Officers appointed to the Special Reserve of Officers for service in the Royal Flying Corps who are serving in the First Reserve shall, in consideration of their holding themselves liable for service with the Navy or Army at home or abroad, and of the performance of the quarterly test, receive, in place of the gratuity of £20 issued to other officers of the Special



The new Deperdussin recently delivered by air to the naval School at Eastchurch. Note the cut-away wings and streamlined body. Also the deck between passenger and pilot, and depth of the fuselage in front.

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Reserve of Officers, an annual gratuity of £50, payable under conditions to be prescribed by the Army Council. Officers of the Regular Army of the First Reserve of the Royal Flying Corps shall receive for such number of days as may be found necessary (regard being had to weather conditions) for the proper performance of their test, the regimental emoluments of their rank, together with flying pay at the rate laid down in Article 1.

(9) Officers of the Second Reserve shall receive no special emoluments as such.

Warrant Officers, Non-Commissioned Officers, and Men.

(10) The daily rates of pay of men enlisted or transferred to serve in the military wing of the Royal Flying Corps shall be as follows:—Warrant officer, 9s.; sergeant, 6s.; first-class air mechanic, 4s.; second-class air mechanic, 2s.

They shall, in addition, be eligible to receive flying pay at the rate of 4s. or 2s. a day, according to their flying proficiency, under such conditions as may be laid down by the Army Council. Warrant officers and others serving in the airship and kite squadron shall, unless they are qualified aeroplane flyers, receive flying pay at the rate of 2s. a day for each day on which they make an ascent by airship or kite.

(11) Warrant officers, non-commissioned officers, and men of the Royal Flying Corps Special Reserve shall receive pay and flying pay at the same rates and under the same conditions as under Article 10, when employed on Army duty. Whilst undergoing, on enlistment, instruction in flying at the Central Flying School, they shall draw the rates of pay laid down in Article 10, and, in addition, flying pay at the rate of 1s. a day.

(12) Warrant officers, non-commissioned officers, and men, other than those serving continuously in the Royal Flying Corps, shall, if performing the quarterly tests to be prescribed by the Army Council, be granted annual gratuities as follows:—(*a*) Whilst serving with the colours, £10; (*b*) whilst serving in the Army Reserve or in the Special Reserve, £20.

Warrant officers, non-commissioned officers, and men serving in the Army Reserve or the Special Reserve who do not engage to perform the quarterly test to be prescribed by the Army Council shall be granted a gratuity of £10. The conditions and method of issue shall be determined by the Army Council.

(13) Army reservists shall not, in addition to the gratuities payable under Article 12, be entitled to pay under Article 1199 of the Pay Warrant, and warrant officers, non-commissioned officers, and men of the Royal Flying Corps Special Reserve shall not be eligible to receive recruits' bounty, training bounty, or non-training bounty.

Gratuities and Special Pensions.

(14) Officers who are (*a*) members of the Royal Flying Corps, (*b*) members of the Special Reserve of Officers (Royal Flying Corps), (*c*) undergoing a private course of instruction, having previously been selected by the Army Council for military flying work, (*d*) undergoing a course of instruction at the Central Flying School, shall, if injured on flying duty, be eligible for gratuities and pensions under the conditions and at the rates laid down in the Pay Warrant for officers who have been wounded in action.

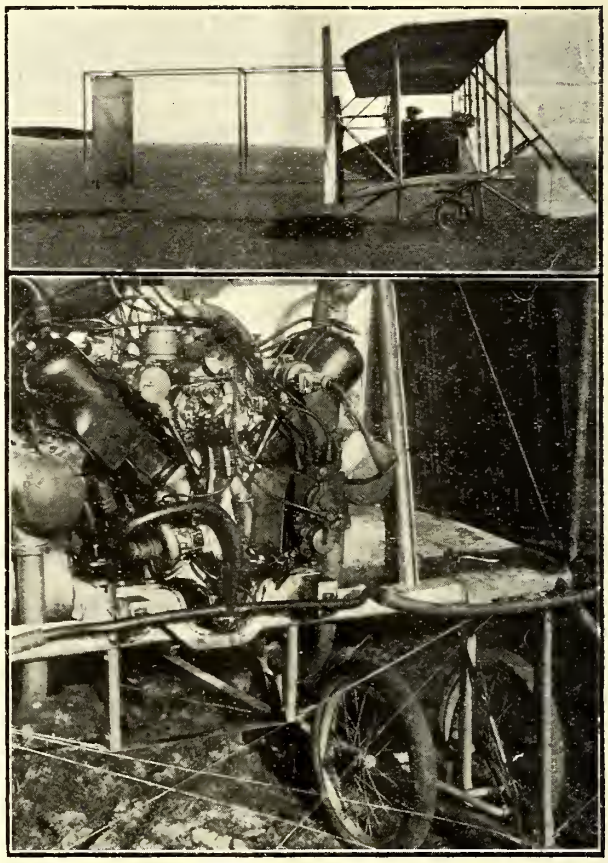
In the event of death within seven years as the result of injuries so received, pensions, etc., may be awarded to the officer's widow and children, or other relatives, under the conditions applicable to the case of officers killed in action or dying of wounds received in action.

(15) Warrant officers, non-commissioned officers, and men of the Royal Flying Corps or of the Royal Flying Corps Special Reserve, discharged in consequence of injuries received on flying duty, shall be eligible for pensions under the conditions and at the rates laid down for their respective ranks in the Pay Warrant in the case of men discharged for wounds received in action.

In the event of death within seven years as the result of injuries so received, pensions and compassionate allowances may similarly be awarded to the widow and children of a warrant officer, non-commissioned officer, or man.

French Military Aviation.

Of the military aviation centres to be formed in Morocco, Casablanca is the only one existing at the moment. Preparations are being made at Fez, Meknès, and Oudjda. As stated before, Captain-Aviator Clavenad is in supreme command of the Moroccan aviation section, whilst Lieutenant-Aviator Van den Vaero commands at Casablanca. Six Blériot monoplanes, all with 50 h.p. Gnôme engines, are at this station. In each case the wings have been cut away near the fuselage that the pilots may have an increased field of vision. A Bessoneau hangar, some light shelters, a 35 h.p. Ariès car, and some bicycles form part of the camp. A Pelletier metal hangar, a Bessoneau hangar, and two collapsible houses are on their way to Fez. Many flights, some of long duration, have been made by the officer-aviators attached for service. The chief trouble with which they have to contend that the terrible sand-storms which are prevalent at the present time.—W. E. de B. W.



Mr. Ogilvie's Wright, showing how the N.E.C. engine has been fitted in front of a streamline body.

Russian Military Aviation.

An appeal for subscriptions is being made to the Russian people by the Petersburg Aerial Fleet Committee in aid of the aviation section of the Imperial Army. This committee is responsible for the formation of the large military aviation school at Sevastopol, where there are at present 55 aeroplanes, with 102 officers and 200 men in training. It has also caused the purchase of 77 aeroplanes, both Russian and foreign, since the beginning of 1910. The Grand Duke Alexander Michaelovitch, who is the president of the committee, insists on the necessity of pecuniary sacrifices on the part of the people if Russia is to retain its position as second in the aviation world.—W. E. de B. W.

Continental Notes.

On Wednesday, April 19th, an action was begun in the French courts by the aviators Martinet, Cheuret, Savary, and Voisin against M. le Marquis de Polignac, as representative of the organisers of the two Reims aviation meetings in 1909 and 1910. They claim damages for injuries to their aeroplanes due to the dilapidated condition of the hangars and to the narrowness of the landing ground. Under the regulations previously issued, the strip of prepared ground round the aerodrome immediately under the course taken by aeroplanes doing circuits was to have been at least 100 metres wide. In actuality the width was only 25 metres. The centre of the aerodrome was covered with ripe corn. Forced landings had occasionally to be made, and owing to the narrowness of the track the machines often ran into the standing wheat, and many bad smashes resulted. For this and for the ruin wrought on the fabric and structure of the aeroplanes by water through the leaky roofs of the hangars Savary claims 9,500 francs, Cheuret 15,000 francs, Gabriel Voisin 50,000 francs, and Martinet 75,000 francs. M.

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Bréguet, who was at first a party to the action, has withdrawn his claim.

The courts of law are busy with aviation matters this season, it appears, for on April 18th the Fourth Chamber of the Court of Paris, under M. Simon, issued its judgment in the case of the Office d'Aviation against Mme. de Laroche. In December, 1909, the Office d'Aviation engaged Mme. de Laroche to fly for them at all important meetings both in France and abroad. Some months later Mme. de Laroche applied before the Commercial Tribunal of the Seine for the cancellation of her agreement on the grounds that the Office d'Aviation had neglected to place an aeroplane at her disposal. The Office counterclaimed for 30,000 francs damages because Mme. de Laroche had flown at two meetings, at Tours and at St. Petersburg, independently of her contract with them. The Tribunal instructed Mme. de Laroche to pay 8,000 francs damages, arguing that there was no necessity for the Office d'Aviation to supply the aviatrice with a machine on which to practise before meetings or to hold one at her constant disposal. She appealed to the Higher Courts, and they have just delivered their judgment in her favour, granting her 10,000 francs damages. Signed declarations by Weymann, Garros, Audemars, Simon, Barrier, Barra, and Latham (that of the latter was of particular strength and emphasis) were admitted as evidence that previous practice on a familiar aerodrome is essential before any exhibition or competition flights on strange aerodromes can be made with any degree of safety.

On April 17th at an early hour John Verrept, the chief pilot of the Borel firm, was killed at Chateaufort while flying a 50-h.p. Borel monoplane under circumstances which point to his end being suicide. It seems from the accounts given in the public Press that shortly before making his last ascent he said he intended to commit suicide because of a quarrel with a woman to whom he was devoted. So in life do trivial causes waste the lives of men. He rose to a height of 300 metres, from whence he made his machine dive to the earth with the engine running full speed. Verrept was unrecognisably battered. He was born at Antwerp in 1888 the child of a prominent manufacturer of that place. His instincts were sporting, and he excelled equally in football, yachting, skating, motoring, and latterly in flying. In March, 1911, he received his pilot's certificate at the Blériot School, Pau. He became at a later date chief pilot of the Borel firm at La Vidamée. On January 20th he beat the two-passenger height record. France has lost a great pilot in John Verrept.

The little bands of aviators who are making exhibition flights in different parts of France in the interests of the national subscription held meetings at Rennes and at Bernay on April 13th. At Rennes Gordon Bell, when finishing a flight, was upset by a gust of wind. He escaped without injury, though the machine was wrecked.

M. Brindejonc des Moulinais is reported to have reached a height of 4,000 metres in the course of a flight from Carcassonne to Limoux. The height record held by Garros is of 4,250 metres. If the gentleman of the complicated name perseveres M. Garros will have to look to his laurels.

A mural tablet has been erected at Siena in memory of the flight across the Appenines by Gilbert le Lasseur de Ranzay, accompanied by the Baron d'Alla-Nocé on a 70-h.p. Blériot two-seater. M. le Lasseur de Ranzay died of typhoid at Florence in January last.

An aviation meeting began at Juvisy on April 21st. Among the competitors were Renaux, Védrines, Aubrun, Tabuteau, Legagneux, Mahieu, Frey, Colliex, Brindejonc des Moulinais, Collin, and Mme. Driancourt. The proceeds of the meeting went to the fund for the assistance of the victims of aviation or of victims' relatives.

Captain Gerrard, R.M.L.I., has been lately learning to fly a Nieuport at Pau.

The Schütte-Lanz dirigible, with Professor Schütte and fourteen passengers on board, was wrecked on April 13th after a short voyage from Mannheim. None was killed, though several expressed annoyance at the brusque termination of an otherwise pleasant voyage. The accident seems to have been due to the innate stupidity of the German pilot. A false manœuvre broke the rudder, and the machine hit the ground. Eight passengers fell out, and the dirigible promptly rose with the remaining six on board. It crossed the Rhine and fell into a forest, fortunately without killing those on board.

The announcement in the *Standard* of a projected cross-Channel service of aeroplanes between Calais and Dover was apparently premature, though the managing director of the Navigation Aérienne, M. Charles Roux, admits that it is the intention of his company to institute such a service in and after July next. The aeroplanes to be used are two Sloan (bicurve) biplanes fitted with 100 h.p. Clergét engines. Floats will be attached that descents may be made on the sea surface if necessary. Four or five passengers as well as the pilot will be carried. The flights will be made each morning at an early hour. It is intended also to institute aerial services between Paris and Brussels and leading cities of France.

M. Weyman is at present in Madrid, making deliveries of Nieuport monoplanes to the Spanish Army. On April 25th he made a long flight over Madrid, accompanied as passenger by Colonel Vivez y Vich (Spanish Army).

Mr. Hamel, at 5.40 in the morning of April 25th, left Issy les Moulineaux, accompanied by *sa passagère habituelle*, Miss Trehawke Davies, with the intention of making a large circuit, touching on the way Brussels, Calais, Dover, London, and then back to Paris. However, when in the region of Compiègne, the petrol tank burst, compelling him to land at the Chateau de Pimbrez, near Ribécourt. After the repair he changed his mind and flew towards London.

Frey, on a new type Hanriot monoplane, made an attempt, on April 25th, on the Deutsch prize for the fastest circuit of Paris. He started from Issy at 4.20 a.m., descended *en panne* in the park at Beauval, and reached Issy again at 6.55 a.m.

On April 24th M. Henri Farman made a long and excellent cross-country flight on the Farman monoplane, and the next day one on his new "fuselage" biplane. On the monoplane he left Chalons with a passenger, and flew to Buc in an hours and a half. Returning to Chalons by train, he next morning flew the new hiplane, accompanied by the same passenger, to Beauvais, where he breakfasted with the Comtesse de Galle. Later in the day he continued his aerial journey, landing at Buc at 7.30 in the evening.

The official figures of Cobioni's flight on March 28th have just been issued. His monoplane is fitted with a 50-60 h.p. six-cylinder Anzani engine. He covered, over the aerodrome of Somma Lombardia, a distance of 330 kilometres in 3 hrs. 5 min. 30 sec., beating the world's records for 250 and 300 kilometres and for distance covered in three hours.

L' Ancienne Société Anonyme des Chantiers Telliers are once again constructing aeroplanes. Their factory is at Saint Omer, where, on the aerodrome of Bruyères Marc Pourpre. their chief pilot, had an accident with the new racing monoplane during last week. The machine was destroyed, but the pilot escaped with comparatively slight injuries.

On April 18th, Guillaume Busson flew from Pau to Paris in a successful attempt on the Coupe Pommery, the contest for which terminates on April 30th. Busson, on a Deperdussin monoplane, left Pau at 5.40 a.m. He landed at Poitiers at 9.20, and recommenced his journey at 11.2. He reached Tours at 12.10 p.m., and left again at 5.5 p.m. He landed at Saint Cyr at 7 p.m. At the present moment he is the holder of the Coupe Pommery.—Pingouin Rose.

Pekin to Paris.

That enterprising newspaper, *Le Matin*, has announced its intention of organising an aerial race from Pekin to Paris and of offering a suitable money prize. Védrines has already announced his intention of winning the contest. M. Blériot intends to enter some machines. It is a lonely journey, and the train service at many points on the direct route is inadequate. The hotels are not numerous, and are not notable for aggressive comfort. The ubiquitous Cook has not yet penetrated to the uttermost seclusions of the route, and his tickets are unavailable. A forced landing in the sacred silences of Tibet may be of enthralling interest, but can hardly be pleasant.

An Accident to M. Védrines.

At 5.15 a.m. on April 29th, M. Jules Védrines, the aviator, started on a flight from Douai to Madrid. He told his mechanics before leaving that they would receive a telegram from him at Madrid at about six o'clock. He was flying a 140-h.p. Deperdussin monoplane. He was seen passing over Saint Quentin and later over Enghien at a height of 2,500 ft. When near Epinay-sur-Seine his engine stopped and he attempted to plane down on to the railway. A morning train from Enghien to Paris stopped that he might make a safe landing. It is said that one of his wings struck a telegraph wire and his machine landed heavily sideways on the line. M. Védrines was thrown out and his head struck one of the rails. He was picked up unconscious and conveyed by train to Paris, where he now lies in a serious condition in the Lariboisière Hospital. The extent of his injuries is not known. The doctors are not yet sure whether his skull is fractured.

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Holyhead to Dublin.

On Friday last The Aeroplane received a telegram as follows:—"Crossed the Irish Sea from Holyhead to Dublin in one hour and quarter. Landed Phœnix Park.—Vivian Hewitt." Terse and to the point, and eminently practical, like the flier.

Mr. Vivian Hewitt has long had the ambition to fly the Irish Channel, and, though he cannot claim the honour to be the first to fly from Great Britain to Ireland, he is, at any rate, the first aviator to fly to the Irish capital, and incidentally he is the first aviator to land in the famous Phœnix Park. Congratulations to him on a very remarkable feat!

As usual, his mount was a Blériot, which make seems to have made oversea flying quite as much a speciality as cross-country flying. M. Blériot will really have to produce a regular amphibious aeroplane for use both on water and land, as his pilots do not seem to be content with confining themselves to either element exclusively.

Mr. Hewitt's success is well deserved, for he has had some rough experiences before actually achieving his object. Writing from Holyhead on the 23rd, he said:—"You have no doubt heard that I am attempting to cross the Irish Sea. Wilson crossed St. George's Channel safely, and I am up here now, waiting for fine weather to do this other crossing.

"I left Rhyl at 5 a.m. on Sunday morning, and after being up for an hour and twenty minutes I was forced to land at Plas, in Anglesey. There was a fearful wind on at the time, and I must been up about 5,000 ft. or more, as I could distinctly see over Snowdon.

"The wind was blowing me away from Holyhead and out to sea, and the only way that I reached the land was by putting the nose of the machine down and letting my engine nearly all out. When I did eventually reach the land and levelled out, the machine at times stood perfectly still, and I was actually blown backwards across one field. I had great difficulty in landing and felt very sick, as I was tossed about like a cork.

"On Monday I started about 9.30, but only got as far as Holyhead, owing to the thick haze. I landed in Lord Sheffield's ground, where I am waiting for fine weather. It has been blowing hard in the wrong direction all to-day. I am most anxious to be the first to cross the Irish Sea, and hope to meet Wilson the other side."

Writing on the 28th from Foryd, Abergele, whither he had then returned, Mr. Hewitt says:—"I successfully flew the Irish Sea on Friday morning. I left Holyhead at 10.30, and landed in Phœnix Park an hour and a quarter later. I passed over Dublin 2,000 ft. up, and experienced very bad air currents when planing down. There was a lot of fog in the channel, and at times I could not see the wing tips."

Mr. Corbett-Wilson's Experiences.

Writing from Kilkenny on April 28th, Mr. Corbett-Wilson says:—"I hope to do a bit of flying over here. My machine is at present at Enniscorthy, getting an overhaul. The landing chassis was somewhat damaged in its encounter with a good honest Wexford stone-faced bank. I landed in fog and didn't realise the field was so small till too late. However, very little damage is done.

"I had a nice passage across till about 15 miles from the Irish coast, when I ran into a squall—wind and rain, most unpleasant—and whatever height I tried it was bad. I had difficulty in keeping my course. After about 30 minutes of it, the motor began to miss, but as it happened I was near land and soon got a glimpse of fields. I staggered on for another 10 miles with a failing motor, and just two miles from Enniscorthy decided to come down. It was still pouring when I landed, and the machine was saturated. I had always had a hankering after the Fishguard route as a way over here.

"When I left Hendon that afternoon I meant to try to get to Chester, as Allen told me he had mechanics there that would do us both. However, after some little time fighting a beam wind, I decided to turn the nose of the machine down wind and go on till I saw the Welsh hills and come down anywhere I could for the night, and if it had not been for the bad oil I got in Hereford I should not have been delayed, as I was cleaning oil tanks and motor 1,300 ft. up in the Welsh hills.

"There I had an escape from smashing, as when the motor started missing—and real bad missing, too—I was 1,200 metres over the hills and saw nothing for it but to come down on to fields either at this angle \ or this /. Either should have proved disastrous. However, by the greatest luck I managed to get down on the only level bit of ground for miles, only 120 yards long and about 40 wide, and well fenced. I had my doubts about getting away, but all went well, and I had a lovely flight over moor and mountain to the sea and Fishguard.

"It's an awful thing about Allen. There is just a chance he was picked up by some outward-bound sailing vessel. But I suppose it is remote."

Mr. Vivian Hewitt, the first aviator to land in Dublin from Great Britain.

A Great Loss.

Members of the Aeronautical Society and those who have dealings with it will hear with great regret that the secretary Mr. T. O'Brien Hubbard, is resigning. It need hardly be said that only the most urgent private reasons could have induced him to forsake an office in which for three years he has been such an unqualified success. Only one who loved the work and realised the importance of aeronautical science could have done what Mr. Hubbard has done, especially considering the worrying and adverse conditions under which he had to work with the old futile Council. It will be almost impossible to replace him, for it will be extremely difficult to find anyone with the same tact, knowledge, good humour, energy, and experience. Mr. Hubbard has, besides his theoretical and scientific knowledge, practical experience of flying, having learned to fly a Short biplane. It is sincerely to be hoped his new sphere of activity will not remove him altogether from aviation.

Our Descriptive Technicians.

A contemporary—and a technical one at that—describing the first appearance of the Bristol monoplane at Hendon, says:—"Of the starts, Valentine's was by far the neatest, incidentally bringing out a hitherto unrecognised quality in the Bristol monoplane. He had no mechanics to hold him back; he simply threw his *cloche* forward, raising the tail, so that his front skids rested heavily enough on the earth to effectively brake the machine. Receiving the signal to start, he merely lowered the tail by a movement of the elevator, and sped off."

There are such things as release gears for aeroplanes. Perhaps Messrs. Rubery and Owen would like to impart some information on the subject to those wishing to emulate Mr. Valentine's performance.

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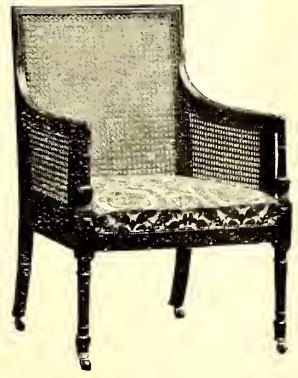
Pupils taught on monoplane with double control.
L. HOWARD-FLANDERS, Ltd., Brooklands Aerodrome, Weybridge.
WORKS: TOWNSHEND TERRACE, RICHMOND, SURREY.



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The Maximum Wing Stress.

(With a Digression on Moments of Inertia.)

BY P. K. TURNER.

There has recently been in the world of aviation considerable discussion of the extreme strains which are likely to be thrown on to the wings of machines when executing certain manœuvres. There was some very interesting argument on the point at the informal meeting held on the 22nd inst. at the Aeronautical Society, when Mr. L. Howard Flanders, the well-known designer and constructor, brought forward a new point which will relieve the anxiety of many of those interested.

In order, however, to make his remarks intelligible, a certain amount of previous explanation is necessary. The manœuvres which would appear, on the face of it, to entail heavy overloads on the machine's structure are: (*a*) The making of extremely sharp turns; (*b*) the commencement of a sudden dive; and (*c*) sudden flattening out after a dive. It is simplest to assume that these conditions are the only ones in question, for although consideration shows that the same effects may often be produced by peculiar states and movements of the atmosphere, it is easier to attempt an estimate of the results if the stresses are assumed to be produced by voluntary movements on the part of the pilot.

The fundamental question in all these manœuvres is centrifugal force, and although the results may be looked at from other points of view, it will be found that it is by far the simplest to reduce them to the effects of centrifugal force, for this depends only on three things; the weight of the machine, its speed of travel, and the sharpness of the turn (or, as it is usually known, the radius of curvature).

The weight and the speed may be regarded as constant, except in the case of the flattening after a dive, and the most important variable is the radius of curvature. The actual curvature of the machine's path is caused by the use of the rudder when turning in a horizontal circle, or of the elevator when making movements on the vertical plane, and the sharpness of the turn depends upon two things—firstly, the power of the control, and, secondly, the "moment of inertia" of the machine.

The power of the controls depends upon the surface of the controlling planes, their distance from the centre of gravity of the machine, and the maximum angle to which they can be moved. The *moment of inertia* is rather more difficult to arrive it, and it seems as well that I should go into the matter rather fully.

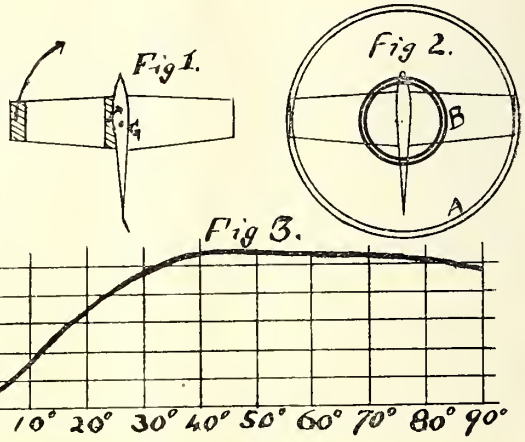
It will be well known to all readers that when any matter whatever is to be put in motion there are two things to be overcome—firstly, the friction between the object to be moved and its surroundings (which in the particular case of aeroplanes includes the friction of the wheels and tail-skid against the ground, and the friction of the whole machine against the surrounding air); and, secondly, upon inertia. These two forces are quite distinct and different in their characteristics; for while the friction is nil when the object is stationary, and increases with velocity, it is constant when the velocity is constant. Inertia, on the other hand, is quite independent of velocity, and depends entirely upon acceleration; it is, in fact, the force which governs and controls the whole universe against the various disturbing forces of gravity and electrical repulsion. The inertia of a body depends simply upon its mass, and the force required to set the body in motion depends on the mass and the acceleration required.

When, however, the motion to be imparted is of the nature of rotation, as in the case in all turning movements such as we are now discussing, the acceleration varies for every minute portion of the object to be moved. In Fig. 1, for example, we have a plan view of an aeroplane, and it will be observed that the rudder is inclined to the right, which means that there is a force tending to turn the whole machine to the right. It is an axiom that a body supported in a flexible medium, such as air, will always turn about its centre of gravity, and the force which opposes the turning moment caused by the rudder is, in the main, due to the inertia of the machine.

It is obvious, however, that the inertia of that part of the left wing-tip, which is shown shaded, will have a greater opposing effect than would an equal mass at the root of the wing (also shown shaded), because, since it has to move farther during the turn, its acceleration will be greater; at the same time its opposing effect is delivered with a greater leverage, so that the inertia will be equal to its mass multiplied by the *square* of its distance from the centre of turn, that is, in this case, the centre of gravity.

In order, then, to find the moment of inertia of the whole machine, the mass of each portion of it (which is equal to the weight of that portion divided by 32, approximately) must be multiplied by the *square of its distance from the centre of gravity,* and the results all added together. We thus arrive at the quantity which is usually known in engineering books by the symbol "I."

A useful extension of the idea is the "Radius of Gyration," which depends on the following conception (Fig. 2 shows another sketch of the same machine): if we imagine that the circle A represents a flywheel, whose centre is at the centre of gravity of the machine, it is obvious that this flywheel will have a moment of inertia of its own. Owing to the fact that the whole weight of the flywheel is concentrated in its rim, whereas that of the aeroplane is to a large extent near the centre of gravity, the flywheel will, if of the same weight, have a much greater moment of inertia. But it is obviously possible to make the flywheel of such a diameter that, although it has the same weight as the machine, it has the same moment of inertia. The radius of this flywheel is known as the *Radius of Gyration* of the machine.



If now we call the weight of the machine w and the weight of its various component portions w_1, w_2, etc., and the distances of these portions from the centre of gravity r_1, r_2, etc., then we have I equal to

$$w_1 r_1^2 + w_2 r_2^2 +, \text{ etc.},$$

divided by 32. Now if the weight of the flywheel, like that of the machine, be W, and its radius R, then the moment of inertia of the flywheel will equal $\frac{W R^2}{32}$ Now it is obvious that the weight W equals the sum of all the little weights, w_1, w_2, etc., so that if we divide the moment of inertia of the whole machine by the weight of the whole machine, we get the value R, which is a sort of equivalent average value of all the values r_1, r_2, etc., and this is what is understood by the radius of gyration.

In actual practice the moment of inertia of a machine is very difficult indeed to estimate accurately, owing to its extremely complicated structure. I have, however, been unfortunately compelled to make the calculation in various cases, and I find that there is a very simple rule which is approximately true, and this is, that in the case of a non-lifting tail machine, the distance of the engine from the centre of gravity is usually very near indeed to the radius of gyration of the whole machine. Multiply this distance by itself and then by the weight of the whole machine, and the result is the moment of inertia.

The method of arriving at the force on a machine during a sudden manœuvre is, firstly, to balance the force of the control against the moment of inertia of the machine, so as to find the sharpness of the turn which can be produced. When this has been done a formula is used which gives the centrifugal force in terms of the speed of the machine, its weight, and the radius of gyration; and it has been found that in certain cases (notably the case of suddenly flattening out after a dive) the centrifugal force produced may be many times greater than the actual weight of the machine. This case is particularly danger-

ous inasmuch as the speed of the machine is probably greatly increased. This increase of speed is due to the fact that the machine, instead of having the usual propeller thrust to force it through the air, is being subjected to a pull caused by the actual weight of the machine itself, which during the dive acts as a propelling force. The machine cannot, as many have stated, achieve a fall like that, for example, of half a brick, as its head resistance is considerably more. Its speed may be fairly simply calculated by the methods shown on page 690 of the 1911 volume of The Aeroplane, where it was applied to the case of the fatal accident at Filey. The method is to find, from the speed of the machine, the horse-power, and the propeller efficiency, the thrust which is being developed. Then find from the angle of incidence and the weight carried the thrust which is necessary to lift the machine in normal flight. The remainder of the thrust actually developed is that due to head resistance, and it will be found that this increases so rapidly with increase of speed that a point is soon reached after which the machine will not travel faster even if it is diving vertically towards the earth.

It was in connection with the above centrifugal force that Mr. Flanders suddenly brought forward his new point, which was as follows :—

Fig. 3 shows the relative pressure on a plane at various angles of incidence, as found by Mr. Eiffel in his recent experiments. This curve is a typical one for a plane of more or less ordinary camber ; and it will be seen that the pressure increases more or less uniformly from 0 degrees to 20 degrees of angle. When the angle is greater than 35 degrees or so, the pressure on the plane actually falls off as the angle increases. We therefore see that at any particular speed *the pressure on the plane can never be greater than that at about 35 degrees, whatever movements the machine may make.*

It follows from this that under no circumstances whatever can the strain on the wings of the machine be greater than this maximum pressure. Suppose, for example, that the machine is descending almost vertically, and that the controls are so powerful that it is possible for the pilot to flatten out very quickly. It is possible, we will say, to flatten out so quickly that the centrifugal force produced would be ten times the weight of the machine. Now suppose that the planes of the machine usually fly at an angle of 6 degrees ; the pressure on them at this angle is equal to two units. The maximum pressure on the planes is five and a half units, and it therefore appears that the air cannot possibly produce on the planes a greater pressure than about three times the weight of the machine.

But we have just shown that if the machine were flattened out as quickly as described, the pressure will amount to 10 times the weight of the machine. We here have an apparent paradox, but the solution is quite simple. The machine would *not* flatten out ; that is, its angle with the horizon would change, but it would not actually follow the course indicated by this change, but would continue more or less on its former course, changing its direction much more slowly, so that the centrifugal force did not exceed the maximum pressure which the air can bring upon the wings.

The same reasoning applies to any other manœuvre which might appear to place on the machine a greater strain than three times the machine's weight ; that is, the machine would entirely refuse to execute the attempted manœuvre, and would only get as near to it as would produce a pressure not exceeding that figure. The rapidity with which any manœuvre can be executed on a particular machine, then, depends entirely upon the ratio between the maximum pressure and the pressure in ordinary flight, and this in its turn depends upon two things : firstly, the form of the curve, which governs the maximum pressure obtainable ; and, secondly, the loading per square foot on the planes in actual flight.

For example, there might be one machine whose planes reach a maximum of only, say, 15 lb. per sq. ft. at 60 m.p.h. Now if the normal loading at 60 m.p.h. were about 5 lb. per sq. ft., the limit of possible stress would be three times the machine's weight. If, on the other hand, the plane camber were such that at 60 m.p.h. the maximum pressure were 20 lb. per square foot, while the actual loading (as in the case of a Farman) were only about $2\frac{1}{2}$ lb. per square foot in ordinary flight, the maximum stress on the machine would be eight times the machine's weight. We therefore see that, while light loading and low head resistance tend towards efficiency, heavy loading and high head resistance tend towards safety, for in the case of a long dive a machine with little head resistance will attain a higher speed than a machine of high head resistance.

It is interesting to note that in the case of a machine turning in a horizontal circle, the correct angle of bank is entirely independent of the weight of the machine ; for if we consider the case of a machine banking on a turn, we have the following forces in action : the weight of the machine acting directly downwards, and the centrifugal force acting directly outwards. Completing the rectangle, we have a resultant force, which is the force to be opposed by the lift of the plane. In order that the machine may be in equilibrium, it is necessary that the line of the planes should be at right angles to the resultant force, so that the correct bank of the machine is governed by the angle *a* between the vertical and the resultant force. This angle depends entirely upon the ratio of the weight to the centrifugal force, and is given by the fraction, centrifugal force divided by weight. The centrifugal force is given by the following formula : $F = \frac{W v^2}{g R}$, where F = centrifugal force, v = speed (ft. per sec.), R = radius of curvature, g = gravity ; and this, divided by weight, gives the result $\frac{v^2}{g R}$ which depends entirely upon the speed and the radius of curvature. If these are known, it is easy to find the angle of bank which should be taken up ; and, conversely, if we know, from the conditions mentioned above, what is the maximum load which can come upon the wings, it is easy to find what is the sharpest possible curve that the machine can be induced to take (however powerful the controls may be).

As Mr. Flanders said at the meeting, this gives a much better chance of accurately estimating the capabilities of the machine and the necessary strength of its parts than calculations based on the power of the control and the machine's moment of inertia ; and the whole world of aviation should be exceedingly grateful to Mr. Flanders for his unselfishness in announcing publicly so important a matter, when he might well have scored over his competitors by keeping strictly to himself.

[All of which is the scientific method of proving what may be obvious when once one's attention is drawn to it, namely, that if a plane be pushed through the air flat—or with the chord instead of the leading edge in front—it can only take up a certain amount of pressure, because after a certain speed the air flows off all round it, and the air in front forms a sort of pneumatic buffer of more or less streamline shape, consequently, on the principle that a teaspoon will not hold more than a teaspoonful, one can never get the loads on a plane which ordinary calculations would indicate. To put it more simply, if one jerks a very fast machine round a corner with a big bank on, the strain on the wings is not what it would be on the wheels of a car of the same weight turning a similar corner at the same speed on the banking of a track, because the aeroplane "pancakes" horizontally and refuses to follow the line of a curve so sharp as to load the wings beyond a certain point.

Similarly one cannot flatten a machine out from a dive into a glide in less than a certain time because, even if the machine becomes horizontal, it pancakes vertically. Thus one sees that as there is a limit to the stress it is possible to put on a given wing, one can afford to limit the factor of safety demanded.—Ed.]

An Interesting Engine Deal.

W. H. Dorman and Co., Ltd., Stafford, announce that they have purchased the business of Mr. W. L. Adams, Redbridge Motor Works, Southampton, together with all his stock of aeroplane engines, drawings, patterns, etc. Mr. Adams has entered their employment as the engineer and representative of the aeroplane engine section of the business. They have a specimen 60-80 h.p. 8-cylinder engine on view at these works, and will shortly be making arrangements to fit it into an aeroplane. They will be glad to send full particulars and description of this engine to those interested, and believe it will prove to be of great interest and value to the British aeroplane industry.

W. H. Dorman and Co., Ltd., are in a position to build these engines of the most superior quality, as they employ about five hundred hands on special machinery requiring the most refined and accurate detail, and have during the past forty years collected round them many of the most skilful workmen in the Midlands. In their motor-engine department they are turning out about twenty-five engines per month for several well-known firms of motor-car manufacturers.

Club Notices.

Owing to the amount of space which has to be devoted to matters of interest to everybody, it is impossible for the present to publish model club notices, and it is hoped that the members of those clubs will recognise the fact that paper is not elastic. Other matters have to be held over at times, and readers are requested to go through the paper and ask themselves what article in that issue they would wish to cut out to make room for the particular feature they miss.

The Week's Work.

Monday, April 22nd.

Brooklands.—At Deperdussin School, Lieut. Porte across country to Addlestone and round about for 15 mins. and later for 10 mins.

At Bristol School, Mr. Fleming up with Lieut. Dawes, and then Lieut. Sheppard, in very bad wind.

At Vickers School, Mr. Knight doing circuits at 400 to 500 ft. for 20 mins. in morning, and in evening Colonel Hoskins rolling and doing straights for 10 mins., and making excellent progress.

In early morning Mrs. Hewlett out on Blondeau-Hewlett biplane, flying well. Now piloting Lieut. Snowden-Smith's small fast machine, and likes increased speed.

Hendon.—At Blériot School, Messrs. Thomsen and Pothet were able to put in small amount of practice. Latter flew couple of circuits in good style, but former only managed to do one straight before wind rose, and continued throughout week. Mr. Henri Salmet, school instructor, anxiously awaiting return from Paris of his 50-h.p. Blériot, which suffered from abrupt landing in Essex on return from London-Paris-London flight. It is due to arrive at Hendon early this week, and M. Salmet can be relied upon to put up some more of his excellent exhibitions at early date.

The Plain (Bristol School).—At 5 a.m., M. Jullerot out, then taking Mr. Jennings and Captain Cordner for tuition flights. Mr. Gordon England up on tractor biplane No. 64 with mechanic as passenger, Mr. Smith Barry for rolling practice on single-seater monoplane, afterwards flying biplane No. 66. Lieut. Antonini good solo on monoplane, and Lieut. Ercole rolling on similar machine as also Lieut. Rinaldi. Mr. Gordon England flew over to Mr. Smith Barry, and M. Jullerot afterwards flew same machine.

M. Jullerot up in afternoon. Wind very gusty. Mr. Pixton out with Lieut. Hartraa. About 7 p.m., Mr. Bendall and M. Jullerot out for solos.

Waterloo (Liverpool).—Mr. Hardman got in a couple of short flights of about ¼ mile each.

Tuesday, April 23rd.

Brooklands.—At Bristol School, Mr. Fleming out early with Lieuts. Dawes and Sheppard. Mr. Smith-Barry from Salisbury out for post-certificate flight, first time at Brooklands. Lieut. Sheppard short hops alone. Then Mr. Fleming in passenger seat instructing Lieut. Dawes.

About 9 a.m. Mr. Moorhouse arrived from Huntingdon, having done 80 miles in 80 mins., in spite of running into fog at Hendon and not seeing anything until after making several circuits low down he recognised Hampton Court. When over Hatfield he was able to see Bedford and Luton quite clearly, so fog was entirely London dirt drifting before east wind.

Mrs. Hewlett out on Lieut. Snowden-Smith's Blondeau-Hewlett biplane, flying in very good style.

Hendon.—At W. H. Ewen School, too windy for outdoor practice. Lieut. S. H. S. Moxley, R.N. (new pupil), joined school.

Wednesday, April 24th.

Brooklands.—Absolutely hopeless weather. Strong N.E. wind.

Waterloo (Liverpool).—Mr. Hardman flew two or three times. Mr. Birch then took charge and had some good practice rolling.

Thursday, April 25th.

Brooklands.—At Bristol School, Mr. Fleming instructing Lieuts. Dawes and Sheppard, both controlling machine and doing some twenty landings. In evening, Mr. Pizey up with Mr. Dawes.

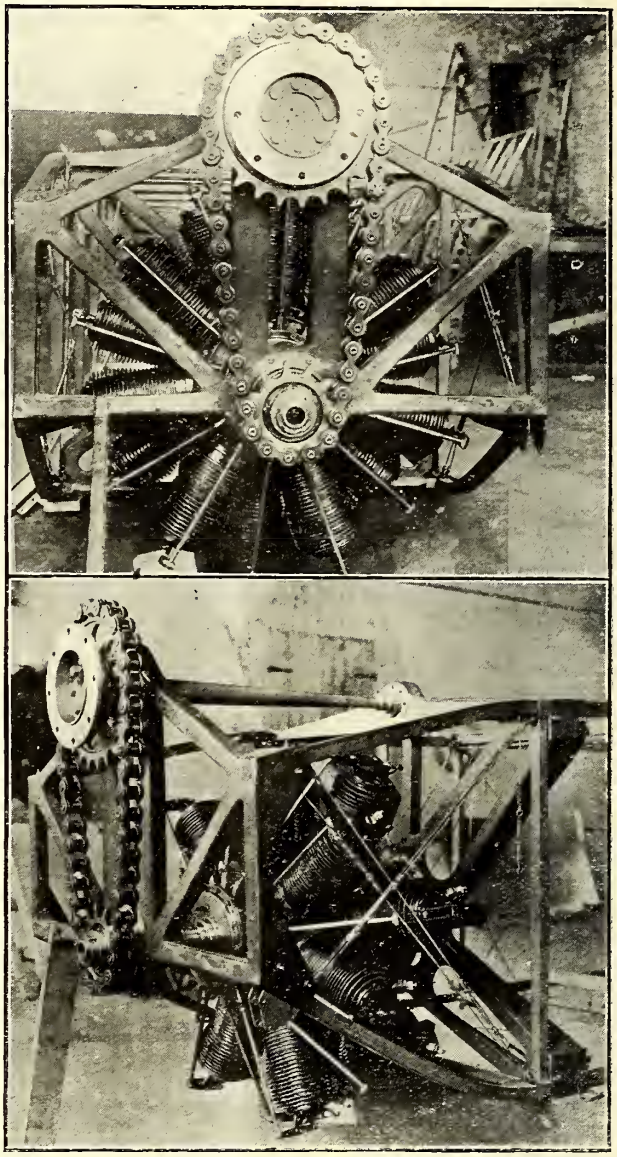
Hendon.—At W. H. Ewen School, practice still delayed by wind averaging 25 to 35 m.p.h. Mr. Dyott, home from America, called to inspect Caudron and greatly impressed by Mr. Ewen taking biplane up to 500 ft. with apparent ease, notwithstanding gusty wind.

Waterloo (Liverpool).—Mr. Fenwick paid a visit on the "Planes" monoplane from Freshfield, returning after short stay. In evening Mr. Hardman again out doing straights and Mr. Birch rolling.

Friday, April 26th.

Brooklands.—Very windy, but at Bristol School Mr. Pizey did short test flight.

Mr. Moorhouse out late in evening, intending to go to Hendon, but came down, owing to dirt-fog from London making it impossible to see across Thames Valley.



The clever fixing of the 100-h.p. engine in the New Coventry Ordnance Biplane.

Late in evening M. Prier out to test new military two-seater Bristol monoplane in gusty wind. Turned down wind, Gnôme ceased firing owing to magneto trouble and machine landed in Sewage Farm, turning a somersault. M. Prier happily unhurt, but machine somewhat defaced, chassis being carried away and fuselage bent.

Fairlop (Essex).—Mr. Petre (The Painter) in evening flying Handley Page monoplane. Getting good straight flights length of ground and up to 50 ft. or so. Congratulations to Mr. Page on having made his first machine fly. Has been in trade some time, but mostly working on experimental machines for other people, or experimenting himself. Has stuck to Weiss-cum-Etrich type of wing and now seems to have succeeded. Present machine has distinct negative angle to wing tips, but does fully 40 m.p.h. with 50-h.p. Gnôme, and flies strongly. Fuselage is pentagonal with slab sides and apex below, as in R.E.P. Mr. Petre's sound ideas on construction, combined with Mr. Page's knowledge of aeronautical theory, should produce something good ere long.

Hendon.—At W. H. Ewen School, Captain J. A. Chamier (new army pupil) joined. Weather still unfavourable.

Saturday, April 27th.

Brooklands.—At Deperdussin School, Lieut. Porte in nasty

wind for 10 mins. In afternoon Messrs. Petre and Sabelli did well in " Get off " competition, Mr. Sabelli beating Mr. Sopwith by 4-5 sec. after tying for 3rd place. During afternoon Mr. Sabelli just starting when Mr. Moorhouse came down in glide on top of him. Did a magnificent banked turn close to ground and cleverly saved very bad smash.

Hanriot now fitted with 40-h.p. A.B.C. engine, out testing. Mr. Partridge rolling on quarter throttle and even then machine lifting slightly. Pilot not used to two handed control, so would not open up.

At Bristol School, Mr. Pizey in " Get off " competition and in evening did a test circuit, but wind too bad for school work.

In afternoon flying almost impossible, so "Get off the Earth" competition organised to amuse crowd. Result: Mr. Fleming, on Bristol (1 sec. start), 1st. Time 5 1-5. 2nd, Mr. Pizey (1 sec. start on same machine), 5 2-5. Mr. Sopwith (scratch, 70 Blériot) and Mr. Sabelli (3 secs. on 35 Deperdussin) tied for 3rd place with 4 4-5 secs. and 7 4-5 secs., and on fly off Mr. Sabelli won with 6 3-5 against 4 2-5 secs. 5th, Mr. Sopwith (4 secs. start on Howard Wright), 9 secs. 6th, Mr. Pashley (3 secs., on Humber), 8 4-5 secs. 7th, Mr. Petre (3 secs., on Deperdussin), and Mr. Raynham (4 secs., on Howard Wright) tied with 9 secs. and 10 secs. respectively. 9th, Mr. Duigan (5 secs., on Avro), 13 1-5 secs. 10th, Mr. Moorhouse (1 sec., on Blériot, with engine missing), 10 3-5 secs.

Later, Mr. Moorhouse and Mr. Sopwith, on the Blériot and R. and M., did some pretty exhibition flying.

Fairlop (Essex):—Mr. Petre again flying successfully on Handley Page monoplane, doing good straights in quite nasty wind late in evening.

The Plain (Bristol School).—Morning very gusty, but in evening Messrs. Pixton, Gordon England, Jullerot and Bendall all out.

Waterloo (Liverpool).—In morning Mr. Hardman out doing straights and Mr. Birch made five well-timed hops. In evening Mr. Fenwick and Mr. Swaby entertained by Mr. and Mrs. Melly to champagne dinner to commemorate Fenwick's flight on the previous Tuesday.

Sunday, April 28th.

Brooklands.—Fierce wind veering from N.E. and N. and back, and between 25 and 40 m.p.h. gusts all day, so no flying till late evening. Then another " Get Off the Earth " competition, won on handicap time by Mr. Sopwith on the old Howard Wright " Family Tank."

Mr. Moorhouse, on the Radley and Moorhouse, did a fine get-off and climbed at a terrifying angle to about 400 ft., did a right-handed circuit and a clever glide back against wind. This machine formerly had a covered fuselage, but at present it has not been re-covered since the last smash. It occurs to one that with its disc wheels and high cowl the fin area in front and low down would make the machine awkward in a side-slip now that it has not a cased fuselage to hold the rear end up.

Mr. Fleming on the Bristol did a very quick get-off twice, machine leaving ground almost as soon as let go. Mr. Sabelli on the little Deperdussin also did a quick get-off and a splendid climb, though very much thrown about by side gusts.

Competition evidently good for trade, for it is rumoured that when Waterloo Station is finished (when!) the L. and S.W. Railway intend to build a station close to the Byfleet gate, where the iron bridge is. Another rumour says that a wealthy firm intends to fit up a mono-rail line from Weybridge Station, or, at any rate, from nearest point of Brooklands property out to sheds, and possibly all round track. Rather a good idea, as it would be cheap to build, and an amusing way of spending time.

At Sopwith sheds, considerable activity on machines in hand. Novel type of engine-in-front amphibious hydro-biplane may be expected ere long. Burgess-Wright now fitted with 35-h.p. Green, *vice* Gnôme exploded. Will be interesting to see what 35 Green can do now it is in the hands of a real engine tuner and driving geared-down propellers. Cannot at moment recollect any 35 Green that has ever had as good a chance of working under best possible conditions.

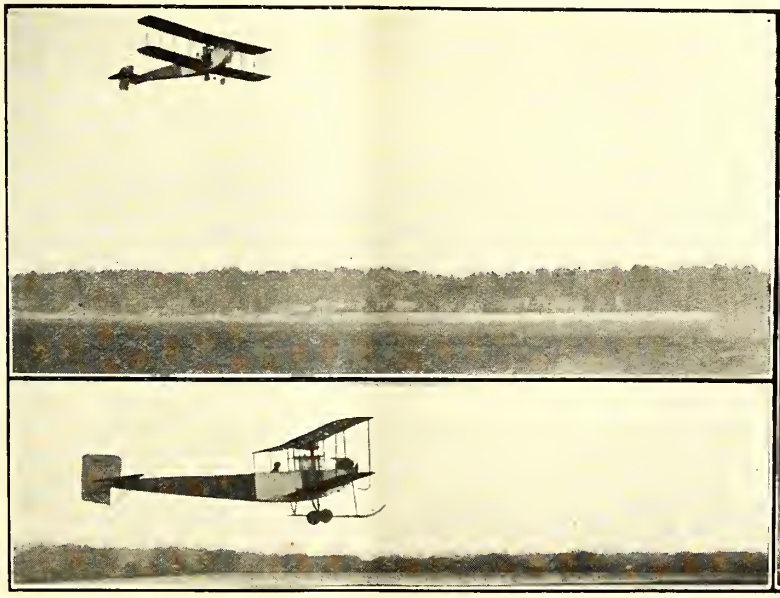
Event of week-end has been arrival of first Coventry Ordnance biplane. Full of novel features, and beautifully built. Altogether a credit to Mr. Howard Wright and Mr. W. O. Manning. Even most critical find it hard to pick holes in design or construct. Local humorists as usual on the spot, and curious hump formed by streamlining pilot and passenger incline them to call it "The Camel." One with recollection of County Council prohibition against flying models in public parks suggested that if it did hit a child in the eye it might hurt him or her. Seems probable, as it has a 10 ft. propeller and a 14-cylinder alleged 100-h.p. engine. Six-inch tyres on wheels; gap of about 8 ft.; colossal streamlined struts; cables fit to hold a liner instead of ordinary bracing wires; doubled controls everywhere; manganese steel sockets and eyes; balanced twin rudders and elevators; everything carefully thought out and calculated; the machine gives one wonderful confidence at first sight. May it be thoroughly successful in practice.

Hendon.—Very fine exhibition flights by Mr. Hamel on Blériot, and Mr. Hucks on the Grahame-White Blériot.

Waterloo (Liverpool).—Mr. Hardman made short flights and Mr. Birch hopped successfully in very difficult wind.

Mr. Duigan's Success.

Mr. J. R. Duigan, the Australian aviator whose certificate flights were noted last week, deserves every credit for the work he has done. It may be remembered that some two years ago he built himself a machine, engine and all, in Australia, and managed to get straight flights and curves out of it. Last year he came to this country, and after studying aviation at the various aerodromes he bought an Avro biplane, which he



Mr. J. R. Duigan, of Mia-Mia, Australia, and the little Avro he has been flying well at Brooklands.

fitted with a 35-h.p. E.N.V. engine. He experimented with this for some time at Huntingdon, and not long ago moved to Brooklands, where he has been working quietly, acting as his own mechanic. Up to the time of getting his certificate last week he had broken absolutely nothing, and had used only 24 gallons of petrol, and a little over 3 gallons of oil, which includes all engine testing. He has been altogether about four hours in the air. At present he is trying experiments with various types of propellers on theories of his own, and seems to be getting increasingly good results by slight alterations in existing propellers. Unfortunately, his engine is a little too small for the machine, but with more power there is no doubt that he and the Avro would do some very fine performances.

The Aerial Tourists.

Mr. Gustav Hamel last Monday gave The Aeroplane details of his fine flight from Paris to Canterbury during last week with Miss Trehawke Davies as passenger on a Blériot tandem two-seater. He left Paris at 5 a.m. on Thursday. After passing Compiègne they overtook a biplane on which they recognised Legagneux as the pilot, and they learnt later on that he was flying over from his aerodrome to lunch with some friends, which is quite a custom of his.

When the pair on the Blériot approached Noyon, about an hour after leaving Paris, a seam in the petrol pipe burst, and they were both drenched with petrol spray. Fortunately, however, the petrol did not catch light, as the burst was at the back of the tank, and they made a safe landing.

The tank was repaired by a local mechanic at Noyon, and on Friday morning they gave up their intention of flying to Brussels, and decided to go direct to London. Along the valley of the Somme the fog was so thick that they were unable to see the ground, so they came down at Abbeville, only some twenty or thirty miles from Noyon. Later in the day they continued to the coast, and came down at Etaples, landing on the beach right in front of the best part of the town, where they caused considerable sensation. Having found out exactly where they were, they started again, and arrived at Hardelot ten minutes later.

After lunch there they went on across the Channel, and in the middle ran into a heavy rain storm. Mr. Hamel said that on this occasion there happened to be a regular line of ships the whole way across the Channel, so that if their engine had stopped they could easily have planed down close to one or other of them. It is, by the way, a fact that, as in the tandem machine the passenger and pilot are so situated that they cannot talk as they can do on the side by side type, Miss Davies having no new scenery to watch, calmly read a book, though Mr. Hamel, not being a literary person, was not particularly interested in what book it was. He states, however, wherever Miss Davies goes on the machine, she invariably makes copious notes of her experiences while in the air and of the scenery observed.

On reaching the English coast they flew towards Canterbury, and then ran into such a heavy rain storm that it was quite impossible to see anything, so they came down in a gentleman's park, where they were very kindly received and where they rested till the weather cleared.

On starting again Mr. Hamel headed for Eastchurch, but they were caught between two rainstorms, and after trying to dodge round them, and going back almost to Folkestone, he sighted the towers of Canterbury Cathedral, and came down not far from the city, Mr. Hamel coming up to London by train in order to fly at Hendon on Saturday last.

He left The Aeroplane on Monday afternoon to go to Canterbury, intending to fly the Blériot back to Hardelot that evening, and to start on Tuesday morning to compete for the Pommery Cup for the longest flight in a straight line during one day, starting and finishing in France.

On Monday afternoon, Mr. Hamel and Miss Davies left Canterbury and reached Hardelot, crossing the Channel in twelve and a half minutes.

The Second Spring Meeting at Hendon.

In spite of a strong east wind blowing in gusts from twenty to thirty-five miles an hour, and at times almost approaching a gale, there was some remarkably fine flying at Hendon last Saturday, the second anniversary of Mr. Grahame-White's fine attempt on the London-Manchester flight.

Competition flying was utterly impossible until quite late in the evening, when most of the crowd had departed, and then Messrs. Hamel, Valentine and Hucks went for the cross-country race to Elstree and back, a matter of about ten miles. In order to start head to wind, the machines were placed diagonally on the starting line, facing towards the east, Mr. Hucks going first on the Grahame-White Blériot, Mr. Valentine a few seconds afterwards on the Bristol two-seater, and, as usual, making a very pretty start with the release gear which he always uses. This release gear seems to interest the public very much, as the operation of starting is so much neater than the usual method of having half a dozen mechanics hanging on all over the tail of the machine. Mr. Valentine, to avoid Mr. Hucks' wash, made a very wide turn and lost a considerable amount of ground, with the result that Mr. Hamel, who started after him on the inside and made a terrific left-hand climbing turn sideways to the wind, was already in front of him as he left the aerodrome. It was possible to see the competitors practically the whole way to Elstree, though without a telescope one could not tell which was which. One could, however, see two of the machines turn very close together, and one in turning was driven a long way down wind, and so came back very wide.

When the machines got close to the aerodrome in the gathering dusk it was seen that Mr. Hamel was slightly in front, followed by Mr. Valentine, with Mr. Hucks some distance away to the left. Eventually Mr. Hamel won in 12 min. 5 sec., Mr. Valentine's time being 12 min. 18 1-5 sec. It was noticeable that, while on a straight course, Mr. Valentine was flying faster than Mr. Hamel, and, but for his turning so wide at the start, he would certainly have won. It is to be hoped that he will have better luck in his next race.

Prior to the cross-country race some splendid exhibition flying was done by Messrs. Hucks, Hamel, Grahame-White, Turner, and Ewen, Mr. Hucks showing that he is really a first-class Blériot flier, and one hopes before long to see him on a really first-class machine, instead of the old Gordon-Bennett winner, which, good as it is, was not intended to be flown with the engine now in it, and consequently is not correctly balanced fore and aft, the heavy fuselage making it necessary to have more angle on the tail plane than is really good for the machine. Mr. Grahame-White, on a Farman-type biplane built in his own works, gave a very fine display, taking the machine up high and keeping her wonderfully steady, considering what a shocking wind there was, and showing once more that he is still unsurpassed as a biplane pilot.

Mr. Turner also gave a very fine display, and Mr. Ewen on the little Caudron made a short but very pretty flight outside the aerodrome towards Hampstead.

Mr. Hamel, of course, was the star turn as a monoplane exhibitionist, and towards the middle of the afternoon he went off with the intention of going to Duppas Hill, near Croydon, where a Territorial recruiting campaign was in progress. After being away about a quarter of an hour, he was seen returning at a height of between four and five thousand feet, and came down in a magnificent spiral, finally coming into the aerodrome head to wind, only a few feet over the thickest part of the crowd in the shilling enclosure—a performance which caused quite a sensation, especially to those who thought the machine might drop on them.

In a gusty wind of this kind, it is really not advisable to fly so close over the crowd, for a sudden gust may just bring the machine within hitting distance, and, at any rate, there is always the danger of dropping odd cylinders off rotary engines. It would have been quite as easy for Mr. Hamel to have crossed over the thin part of the crowd a couple of hundred feet up, and to have landed out in the middle of the aerodrome, though, of course, it would not have been quite so entertaining to those who did not think of the risk.

Mr. Hamel's return was caused by the fact that, when he got to Brentford, he ran into a thick fog, through which it was impossible to see, although it was perfectly bright and clear at Hendon. This fog was apparently caused by the east wind blowing all the London smoke straight up the Thames Valley and making a regular wall of fog, on which the sun was shining with much the same effect as the head lamps of a car in a mist. Mr. Hamel tried to get under it by coming down to 150 ft., and tried to get over it by going up to 300 ft., but without effect, so he very wisely came back.

On next Saturday, May 4th, the first May meeting will take place, weather permitting. The events include a passenger-carrying speed handicap over eight laps of the course; a cross-country handicap, which, of course, is the most entertaining of all forms of competition; an altitude contest; and a speed handicap, in which it is more than likely that several interesting new types of machines will compete.

Mr. Barber's Plans.

Mr. H. Barber has decided to give up flying and the construction of aeroplanes on account of the steadily increasing expense of keeping to the fore. Events move so rapidly in aviation now that in his opinion it is necessary to build at least a machine every two or three months if one is to keep abreast with the times, and, needless to say, a hobby on those lines is pretty expensive.

Mr. Barber has been a prominent figure in British aeronautics since the early days when he was the solitary aviator on Salisbury Plain, now one of the most important aviation centres in England. It was there he carried out much experimental work, and taught himself to fly on a machine of original design invented by himself. All his machines, over two dozen of them, have been built to his design. The first was an all-steel monoplane with reciprocating wings, and fitted in front with a 52 h.p. Antoinette engine. The next, while a monoplane, was much on the same principle as the Voisin *Canard* of later date, and had a 60 h.p. Green engine. Then came a long string of the well-known *Valkyries*, and latterly the *Viking* biplane.

Last year Mr. Barber, according to flights recorded in the Press, flew 6,718 miles, and carried 151 passengers, of whom 42 were ladies, besides making innumerable unrecorded flights, which would probably treble the above mileage.

Mr. Barber tells The Aeroplane that he intended to go for an extended cruise in the Mediterranean, but owing to several advances he has lately received from aeronautical firms he had decided to continue his connection with aviation as a consulting aeronautical adviser. A book of his experiences and on the possibilities of aviation will probably soon appear, and it should make very interesting reading, especially if he tells the stories of his big flights as well on paper as he does verbally.

Aviation in Scotland.

Mr. Walter G. Duncan states that by the fire at the Barrhead Aerodrome, on the 13th, aviation in Scotland has received a severe set-back, and fears that it will be several years before any further progress is made in Scotland.

After setting forth the difficulties that the Scottish Aviation Company had in constructing an all-Scottish machine to compete for the *Daily Mail* prize, he says:

"We had actually reached the stage when we were ready to run out for trial the completed biplane of the Farman type, which had in every detail been manufactured and built in Scotland. The result of the many months of labour was highly commendable. The fire has, however, made the possibility of this prize being won impossible.

"Scotland will now fail to be represented in the military competitions, and there is now no possible chance of any orders being placed in Scotland, as the Avro-type biplane which was being completed, is now a mass of ruin, and the time is now too short to permit of a machine being built and tested.

"It was further hoped to promote a greater interest in Scotland by making a circuit of Scotland, for which the company intended using their three machines. The route proposed was to fly from Barrhead to Edinburgh, and then on to Perth, Dundee, Arbroath, Montrose, Aberdeen, Peterhead, Fraserburgh, Banff, Elgin, and Inverness, the return journey being made via Keith, Inverary, Aberdeen, Forfar, and Stirling. With the co-operation of the various towns on this route much useful work would have been accomplished in bringing before the populace of Scotland the possibilities of the aeroplane."

Hanriot (England), Ltd.

As noted last week, the famous French aeroplane firm of Hanriot, realising that England is bound to become in the near future one of the foremost nations in the air, have decided to build here. A company has been formed to carry out this project, named Hanriot (England), Ltd., and Mr. Maurice Ducrocq has been installed as general manager, with Mr. Will A. Bennet to look after the publicity work.

Most of the fast French monoplanes suffer from the disadvantage, even in the hands of the most skilful pilots, of requiring a great deal of room for alighting and before actually touching the ground. This is no drawback in France, where there is plenty of open space; but in England, where the fields are small, the usefulness of many French monoplanes has been seriously discounted. The Hanriot monoplane, it is claimed, although extremely fast, can pull up in the shortest distance of any machine yet made.

Marcel Hanriot has been doing great things lately at Reims on the new Hanriot monoplane, and on Thursday last passed the second test for his military brevêt. He had just returned from Italy, where he had been called by the Italian Government to demonstrate the Hanriot for military purposes. The result was an order for four two-seater monoplanes.

Brooklands has been chosen as the headquarters of the British firm, probably on account of its proximity to Farnborough. Officers of the Air Battalion will shortly be given an opportunity to test for themselves the qualities of the new Hanriot.

André Frey, one of the best pilots, who is now flying the Hanriot monoplane, the other day, over a measured course at Reims, flew one of the type which will be introduced in England this month, at a speed of 85 miles an hour.

A Hanriot monoplane has been entered for the Brooklands Flying Handicap on May 4th, and three Hanriots will appear in the competition for the Grand Prix de l'Anjou in June. It is worthy of note that at the moment of writing there are only two entries for the Pekin to Paris race which is to be held next August—Hanriot and another.

Trials with the new Hanriot monoplane have recently been completed by Lieuts. Menard, Marlin, Gobert, and Pierra. The first, a confirmed biplanist, is now quite converted to the monoplane, and all were able to fly the Hanriot at the first attempt Some dozen machines or so are about to be ordered by the French War Office as a result of their tests.

Mr. Vivian Hewitt, who on Friday last flew from Holyhead to Dublin in one hour and a quarter.

The Fabric Case.

Mr. E. T. Willows was defendant in an action brought before Mr. Justice Scrutton last week by the North British Rubber Company, Ltd., for £253 4s. 2d., on a bill of exchange made in April, 1911, in respect of a balance of account. The defendant pleaded that warranties given of material supplied for the envelope of a dirigible balloon had been broken. He counterclaimed for loss and damages arising from the alleged defective material.

Mr. Abel Thomas, K.C., said defendant told plaintiffs that he wanted an envelope that would be large and strong enough to carry him to Paris with a passenger. The plaintiffs recommended the use of a certain fabric, which worked well for a time, but after three months the gas escaped so freely that the balloon became worthless. The real question was whether there was a breach of contract, and, if so, what was the value of the balloon to the defendant now. Counsel suggested that the fabric ought to have lasted, at any rate, for two years.

The defendant said he went to the plaintiffs for the fabric instead of to a Continental firm because he wanted to keep his machine completely British. After purchasing the fabric, and being assured that it was equal in every respect to what he could get from a certain firm he mentioned, he completed the construction of the envelope, and between October, 1910, and the April of the following year he made a number of flights in England and in France. On November 4th, 1910, he made a flight from London to France, and carried a passenger. Early in 1911 he found that there was a considerable leakage of gas from the envelope, and the balloon became worthless. In consequence of this he had been unable to carry out a number of engagements.

In cross-examination, Mr. Willows admitted that in the course of seventeen days he had made about twenty flights. The journey to Paris was spread over a number of stages. Only in one case did a mishap occur to the fabric of the balloon. He did not recollect that on one occasion the machine was moored in the open for upwards of a week.

Next day Mr. Mervyn O'Gorman, called for the defendant, said that he was a consulting engineer and superintendent of his Majesty's aircraft factory at Aldershot, also a member of the Advisory Committee. He tested part of the fabric of the envelope in question on October 26th last, at Wolverhampton, and he found it exceedingly porous and quite useless for balloon purposes. The fabric of the Army airship *Gamma* had lasted for two and a half years.

Mr. Justice Scrutton remarked that he had read in the newspapers of mishaps to Army balloons.

The witness replied that there had never been any accident to an Army balloon. It had often been reported, but never was a fact.

His Lordship: "One was reported in the paper this week as having come to grief when going into a shed."

The Witness: "That was only a small thing. It was patched up in two hours. The matter was magnified and the balloon represented as a wreck."

Mr. Schiller (cross-examining): "Am I right in saying that the Clément-Bayard airship never flew after the War Office bought it?"—The witness said that it was difficult for him, having regard to the official position he held, to answer such a question.

"Do you tell me that the Clément-Bayard is now an effective Government airship?"—"No."

"It is common knowledge that it never flew?"—"It may be common knowledge, but I do not want to get into hot water by acknowledging it." (Laughter.)

Sir F. Low contended that the witness could not give evidence and then protect himself under the cloak of officialdom from having that evidence tested. The plaintiffs were put in a position of great difficulty, for another gentleman employed by the Government had refused to come forward. That was one of the evils they were always coming across, of people trying to serve God and Mammon. (Laughter.)

His lordship said that the witness appeared to hold the position of Pooh Bah by acting in more than one capacity. (Laughter.) He acted in the private capacity of a consulting engineer, and also in the official capacity of superintendent of the Government airship factory at Aldershot.

Sir F. Low: "My friend wants to know which is God and which is Mammon in this case." (Laughter.)

Mr. Thomas: "Yes. Is it the Government of the public?"

The witness, further questioned, said that he did not know how old the Clément-Bayard was when the War Office bought it, but he believed it had been in existence for some time.

His Lordship: "Some newspaper—I forget which—no doubt from purely philanthropic motives, conceived the idea that the public should buy the airship, and persuaded somebody to do it. Whether that particular newspaper ever makes reference now to the success of this adventure, I do not know."

The witness, further questioned, said he wished to know how far he might be allowed to object.

His Lordship: "You put a considerable responsibility on a judge who does not know how far your arrangements go with the War Office."

Mr. Schiller said he would avoid asking questions dangerous to the State. (To the witness): "Is it not your experience that the lives of dirigibles are very short?"—"It varies. Some have been very fortunate, and have escaped coming to grief for a long time."

On the resumption of the case on Thursday, Mr. Thomas, K.C., referred to observations which had been made the previous day concerning the evidence of Mr. Mervyn O'Gorman. He explained that Mr. O'Gorman was only engaged by the Government for two days a week, and, therefore, he was entitled to act as an adviser to others and to give evidence.

His Lordship: "If he has a special arrangement and he comes here to give expert evidence, he must answer questions in cross-examination with regard to his experience. If he says, 'I ought not to answer these questions,' when they relate to his official experience, he puts the Court in a very unsatisfactory position. You heard what happened yesterday. There was a good deal of shying at some of the questions, the witness saying he ought not to answer them because he might get into hot water."

Mr. Eustace Short, partner in the firm of Messrs. Short Brothers, aeronautical engineers to the Aero Club, and balloon manufacturers, said that two balloons supplied by his firm were made of fabric supplied by the plaintiffs. The balloons made ascents in Chili and the Argentine, and the fabric, which in one case was the same as that supplied to the defendant, had proved satisfactory.

Mr. Percival Spencer, of the firm of Messrs. C. G. Spencer and Sons, balloon and airship manufacturers, gave evidence to the same effect.

Cross-examined by Mr. Thomas, the witness remarked that the Clément-Bayard airship had been so long maintained inflated before it arrived in this country that it deteriorated to such an extent as to be useless after it came to London. A balloon would be eminently satisfactory if it had a continuous life of six months.

In further evidence, the witness said that, assuming that Mr. Willows' dirigible had been two months in a garage, and that it was in use in the open air 200 hours, it had had a good life.

Mr. Willows (recalled) denied that men in their ordinary boots walked over the envelope of his dirigible while it was in the course of construction.

His lordship, after hearing counsel, said that he would give judgment this week.

The London Aerodrome Club.

All those interested in aviation are reminded that a club is in process of formation at the London aerodrome, and that a club-house is about to be erected, which it is hoped to open in June. Members of the new club will have special privileges at the meetings, and will have every comfort at their command at all times, and, as special concessions are being made to the first thousand members joining, it is well worth everyone's while joining on these special terms.

Transport at Brooklands.

Mr. H. H. Beach, of the Holstein Garage, Weybridge, writes that he has arranged to run a motor-wagonette between Weybridge Station and the Byfleet entrance of Brooklands track. The vehicle will commence running on Saturday next, and will run on Sundays and any day when there is sufficient attraction to draw visitors. Fare 1s. each way.

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1 PASSENGER CARRYING SPEED HANDICAP.
2 CROSS-COUNTRY HANDICAP.
3 ALTITUDE CONTEST for the St. Ivel Cup.
4 GRAND SPEED HANDICAP.

NEXT WEEK. **SAT., MAY 11th, at 3.30 p.m.** (Entries close May 7th.)

1 CROSS-COUNTRY TEAM HANDICAP.
2 GRAND SPEED HANDICAP.
3 ALTITUDE CONTEST.

FORTHCOMING EVENTS.

SAT., MAY 18th.—SUMMER MEETING.
SAT., MAY 25th.—SECOND LONDON AVIATION MEETING (FIRST DAY).
SUN., MAY 26th.—EXHIBITION AND PASSENGER FLIGHTS.
WHIT MONDAY, MAY 27th.—SECOND LONDON AVIATION MEETING (SECOND DAY).
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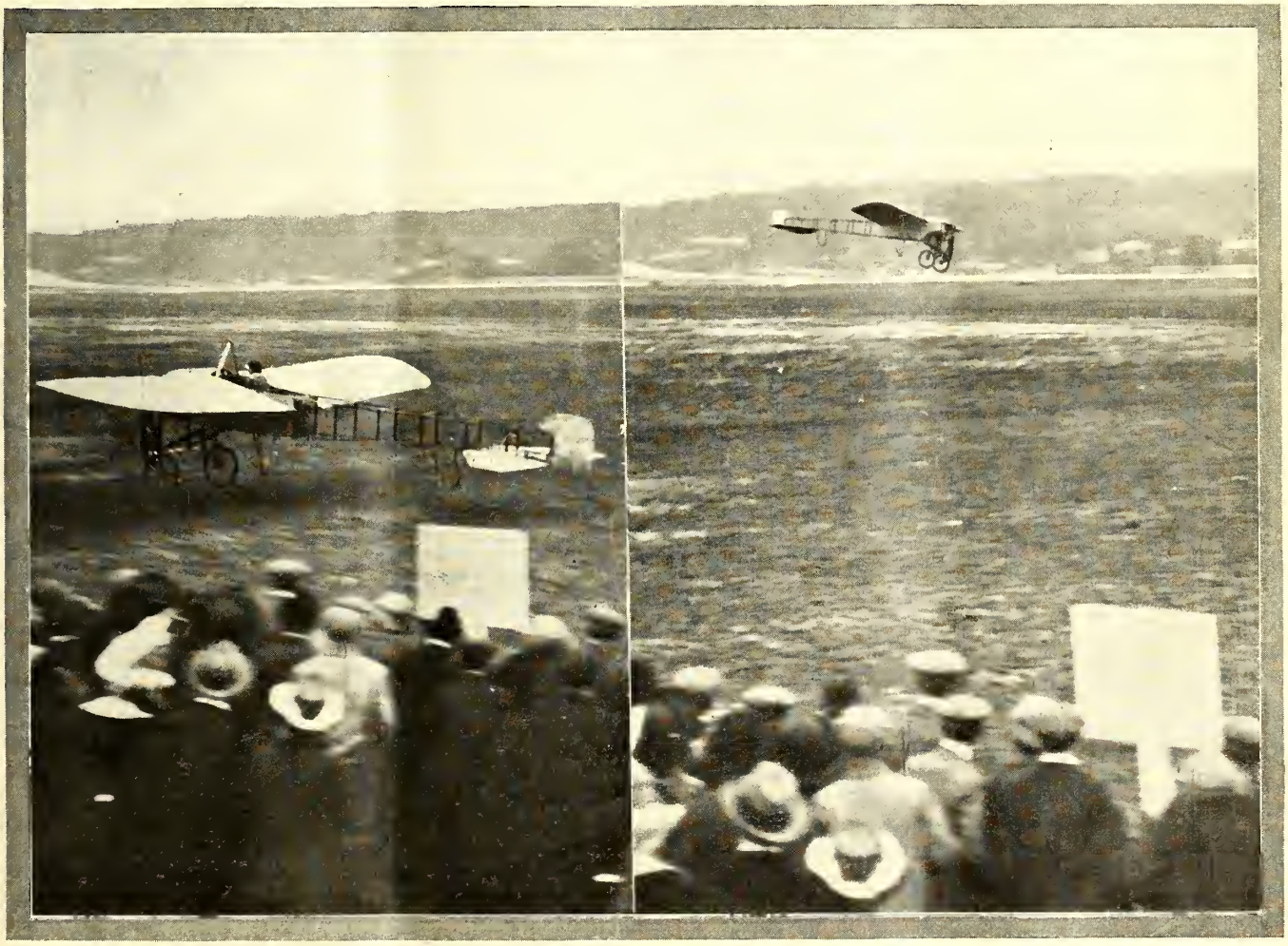
OUT AND HOME.



Mr. T. O. M. Sopwith, the winner of the Malcolm Cup at Brooklands on Sunday last, on his 70-h.p. Blériot, just getting off at the start, and just crossing the line at the finish of the race to Chertsey and back.

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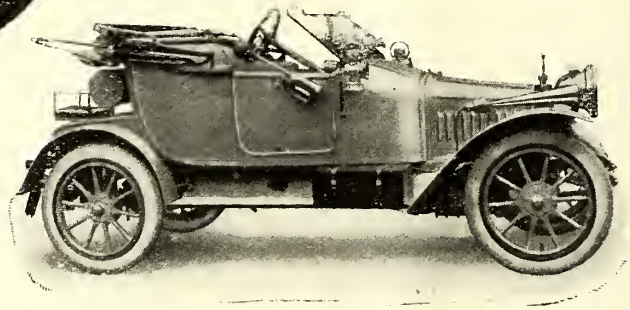

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MATTERS OF MOMENT.

CIVILIANS AND THE ROYAL FLYING CORPS.

Elsewhere will be found a fairly full account of the interview which took place in the House of Commons on Tuesday of last week between Colonel Seely and General Henderson, on the one part, and a varied assortment of aviators and members of the Royal Aero Club on the other part. The interview was in some ways instructive, in some ways confusing, often amusing, and occasionally banal, but, from the mass of questions and answers, one thing emerged clearly, namely, that the War Office officials do not want civilians in the Royal Flying Corps unless they are very much in earnest. Which is just as it should be, and precisely what was advocated in these columns a fortnight ago.

As the discussion progressed one could not help feeling that there was something going on behind the scenes that was not explained, and is never likely to be explained. Colonel Seely seemed so genuinely anxious that civilians should join the Flying Corps, and yet the conditions imposed—presumably by his Advisory Committee—seemed so carefully designed to prevent them from doing so, that one acquired the impression that while the political element at the War Office is keen on raising a big aerial force largely composed of civilians, the military element prefer a small, highly-trained, purely military force. The writer uses the word military advisedly, for throughout the meeting the Admiralty point of view was not officially put forward, which is much to be regretted, though certainly Colonel Seely laid stress on the importance of the naval air-scout.

Now, undoubtedly, as a piece of political "window-dressing," it would look well to be able to announce in the public Press that we have been able, thanks to the patriotism of our "expert airmen," to raise in a few months a flying corps equal in number to that of any rival Power, but from a severely practical point of view it will be much better to adhere strictly to the intention apparently disclosed at the meeting of freezing out from the Royal Flying Corps all those who cannot devote themselves body and soul to the Service.

It is, however, a fact that a number of really good men can be acquired for the Flying Corps if one alteration is made in the scheme as it exists at present. The pay offered is not inadequate, amounting as it does to a pound a day for subalterns on the permanent establishment, especially in view of the fact that the Flying Corps mess will probably be a fairly cheap one, owing to the fact that headquarters will be in the middle of Salisbury Plain, instead of in an expensive military station. The fatal defect is that the pension arrangements are all wrong.

Under the present scheme a daring, reckless flier may pass through the Central School—possibly acquiring a big reputation as a flier—and after a year or so may smash himself up just so badly that he cannot fly again, and he thereupon retires on a war pension. On the other hand, a more careful and more skilful flier, a man with brains, who has become an officer of real value, may serve his four years without accident. He may then be taken on from year to year for a further four or five years, becoming more and more valuable, till after nine or ten years he is thought too old to fly, and is retired—without a pension. The thing is unfair on the face of it.

The reason for refusing at the present stage to make any allowance for pensions is, of course, that, as was pointed out in this paper some months ago, many aviators believe that a man's flying nerve goes after a year or two of steady work, and as the whole scheme is confessedly tentative, it is practically impossible to fix a definite length of service for pension purposes; though, as a matter of common sense, it is hard to see why a man who breaks a leg badly enough to qualify him for a pension should have preference over a man who breaks his nerve in the country's service.

However, it is quite certain that before the first batch of four years' service men have completed their period, service in the Royal Flying Corps will carry a pension as surely as it does in any other Service. And inside the same period the science and practice of aviation will have so progressed that failure of nerve will not limit a man's length of service any more than it does in the cavalry or artillery.

Therefore, the sooner the authorities make up their minds to fix a period which qualifies for pensions the sooner will they get the right class of man to enter the Royal Flying Corps and take up flying as his life's work.

The civilian reserve never can be any real good in time of war, except on a purely Territorial basis, for home defence, and that fact may just as well be faced first as last. It would be grossly unfair to ask men with big business interests like Messieurs Grahame-White, Barber, and Cody—taking the three names mentioned by Colonel Seely—to turn out with our Expeditionary Force for some over-seas war like that in South Africa, just because the number of trained naval and military pilots on the permanent establishment was insufficient. Such men would be much more useful at home, turning out machines for the use of the air-scouts abroad, or training new pilots to replace those who had gone out. On the other hand, in case of actual invasion a civilian reserve on a Territorial basis would be extremely useful, even if the basis were widened somewhat to permit

of the Reserve being used as naval scouts outside the sacred three-mile limit. It might, for example, include the North Sea, Baltic Sea, English Channel, and North Atlantic, without raising too strenuous objections.

That officer-aviators are needed for the permanent establishment of the Royal Flying Corps over and above what the Navy and Army can supply is obvious. The Navy is already notoriously short of officers, and it is a fact that because the type of man most suited for flying is of precisely the same type as is required for submarine work, the difficulty is accentuated, for the submarine service is becoming more and more important and the difficulty of finding suitable officers for it is becoming greater and greater, therefore none of these men can be spared for aviation.

There is no use in burking the fact that Germany is the Power which sets the pace for us, and the greater Germany's submarine service becomes the greater is our own need for submarines and the greater our need for aeroplanes with which to locate those of our rival.

And the Army cannot supply the aviators the Flying Corps needs, for officers commanding battalions are already, and naturally, unwilling to let their best and keenest officers go for three months at a time to learn flying. How much more unwilling will they be in war time to let those same officers who are on the First Reserve of the Flying Corps leave their regimental duties at the regiment's most crucial period?

Therefore, if the Royal Flying Corps is to be fit for its purpose it must be largely made up of men who are to-day civilians, but who by next year will be officer-aviators. The pay, as has already been said, is adequate. It is a definite pension scheme which is required to attract the right type of man. This country is full of young men of the exact class required: younger sons of good families, sportsmen and gentlemen: men who would be in the Army if they could afford it, as all their family traditions are those of the Services. To-day they and their like are pioneers all over the world, ranching, gold digging, prospecting, officering the troops of quaint little countries in the odd corners of the earth, nigger-driving in equatorial plantations, and only too often drifting into the "Lost Legion," of which Mr. Kipling sings:—

"Our fathers they left us their blessing—
They taught us, and groomed us, and crammed.
But we've shaken the Clubs and the Messes
To go and find out and be damned."

Instead of upsetting our already under-officered Navy and Army in the endeavour to find enough air-scouts, does it not seem a more reasonable proposition to catch some of this material young, before it has developed its worst vices, and put it in an aeroplane "To go and find out and be damned"?

By all means stiffen the Corps with trained sailors and soldiers, such as those who for the last year or more have been assiduously making bricks without straw on Salisbury Plain and at Eastchurch, and give other officers a chance of transferring to the Flying Corps if they really desire so to do, but having once taken the revolutionary step of organising a fighting service in which the officers are paid a living wage, let us go the whole hog and buy the type of man most suitable for the purpose.

Or, if civilians are not wanted, let us drop the "window-dressing" scheme, and set to work properly to fill the Corps with officers who are already disciplined and trained to scouting work.

More Details of the Monaco Meeting.

Among recent visitors to The Aeroplane was Mr. H. J. D. Astley, who was in town for a few days, pending his return to France. Mr. Astley's personal account of the hydro-aeroplane meeting at Monaco is distinctly interesting. As was noted recently, he has no great admiration for the Henry Farman machine which won, as, he said, it appears to be lacking in all the good qualities of a flying machine, except for the fact that it flies, and he ascribes its victory to the clever piloting of Fischer. On the other hand, he is quite enthusiastic about the Maurice Farman machine piloted by Renaux. This machine, he said, appeared to be wonderfully stable, and to have marvellous lifting powers, probably due to the fact that it is fitted with a 70-h.p. Renault engine and has a geared-down propeller; also, it has double-surface planes and a stream-line body, so that everything about it must be very much more efficient than in the Henry Farman machine. It is, therefore, all the more wonderful that the British Admiralty should go and buy the inferior machine.

Mr. Astley said that, if Renaux had had his engine tuned up before he arrived at Monaco, instead of having to waste two days working on it, he would have won everything with ease. One of his favourite feats, apparently, was to take up four passengers all at once, fly in over the town, shut off his engine about 300 ft. above sea-level while still over the shore, and then glide three complete circles with a most astonishing bank before touching the water.

The most abject failures of the meeting apparently were the Voisin-Canards, and Mr. Astley said that on two occasions when the motor stopped, first Colliex and then Rugére, apparently afraid to glide properly, shoved the nose of the machine straight down, and then failed to get it up again before they hit the water. After a dive of a couple of hundred feet, the machine struck the water almost vertically, and did not show the slightest sign of flattening out, the whole thing disappearing bodily under water. On one occasion M. Séguin, of the Gnôme engine, and another passenger, who were with Colliex, were very nearly drowned before they could disentangle themselves from the mass of wires behind them.

Of the Curtiss-Paulhan machines Mr. Astley said that, though they are about as badly built as anything he has ever seen, they certainly fly wonderfully well, and that Robinson's performances were astonishing. On the one windy day of the meeting he took the machine into really rough water, and plunged in and out of the waves without apparently upsetting anything in the least. From the quay to the water there was erected a sloping arrangement of boards, down which the machines were lowered to get them into the water. Robinson had a favourite trick of coming down in the water in the harbour, tearing along the surface with the engine wide open, and then flying up this slope till within a foot or two of the top, when he would switch off and come down bang on the bottom of the float, either on the boarding itself or on the coping-stone of the quay, which was a few inches higher than the end of the boarding, or else on the gravel on the top of the quay, none of which were exactly good for the float itself, though somehow it stood it. Another of Robinson's tricks was to come down almost vertically from a matter of 200 ft. or so, and then flatten out suddenly about 4 or 5 ft. from the water, just when everybody thought he was going in head first.

The Sanchez-Besa machine was described as a steel-built Voisin of the ordinary type, with an elevator on the tail and no front elevator, and fitted with really excellent floats, which got it off the water very quickly. Unfortunately, the tail arrangements of the machine gave way, fortunately close to the water, and the whole thing sat down backwards, the floats eventually appearing on the surface, with the rest of the machine underneath.

The machine which particularly took Mr. Astley's fancy was the little Caudron, which, although it was only a make-shift affair, consisting of an old Caudron cellule and an experimental float, was certainly the fastest thing there, and appeared to be wonderfully stable and handy.

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Notes on the Official Memorandum.—*(Continued.)*

BY W. E. de B. WHITTAKER.

The subjects dearest to one's heart and mind invariably assume a disproportionate importance to us in the scale of things that be, and we are inclined to over-estimate the value of such subjects in the general scheme of life.

The specialist in most cases regards himself as an essential being, and believes that his position is naturally of more distinction than that of the man whose knowledge is general. Because of this tendency it is difficult to form an air corps for either the Army or the Navy without displeasing the civilians it is desirable to employ, or, on the other hand, the soldier or sailor as a class.

Questions of rank and precedence are a frequent cause of trouble. The civilian of so-called experience and mature age resents the necessity of beginning as a second lieutenant, and, on the other hand, the soldier would be rightfully indignant if a higher rank were bestowed. If a civilian becomes attached to the military wing of the Royal Flying Corps, and so is on the active list for four years or possibly longer, the tension becomes greater towards the end of the period of service. Such civilians, as a rule, would acquire but little knowledge of military science, but by the ordinary process of seniority they would be after, let us say, three years' service senior to more recently joined soldiers who have, or are presumed to have, that knowledge. Consequently, as tact is not a general quality, there will be trouble.

As regards promotion, it should be remembered that from time to time it is announced with due gravity that merit and not seniority will regulate the rise of men to high places. Unfortunately, it is too frequently the merit of being related, even though distantly, to the lady friends of those whose word is law that counts for most in the struggle for success. In times of peace it is almost inevitable that seniority should be the principal base on which an officer's advancement should rest. It certainly eliminates favouritism if it sometimes exalts ineptitude. And even an iconoclastic Liberal Government cannot stay the hand of Fate.

No good ever came from an intermingling of the civil and military sections of the community for the purposes of war. As certain critics ever delight in telling us, there have been in military history such men as Oliver Cromwell and "Stonewall" Jackson, both of whom were civilians. It is because these and such as these are exceptions to a general rule that their fame stands so high. They are not to be found at will.

If military genius can be found as readily in the places of petty business as some would have us believe, it is absurd to maintain a standing army at great cost. We ought to trust our national future to the Territorials. All this makes the question of rank one of increasing difficulty until some new form of entry is used in the Royal Flying Corps. So bewildering will things become that one imagines the entire organisation of the corps will be altered before the lapse of the first period of four years.

Pay and Allowances.

More important than precedence at the moment is the question of pay and allowances. The average Army officer at present can hardly be accused of occupying "a place of profit under the Government." The military career is not a ready road to affluence and financial prosperity. Therefore it is to a large extent the preserve of men with private means. Let him who complains most freely of this be the first to ask for increased taxation that the Treasury may be more liberal to the King's Services. But this gratuitous labour in the country's interest can hardly attract any number of those who have acquired special knowledge of subjects of importance to the Army, and it is therefore necessary for increased emoluments to be offered to such persons. So it is that special arrangements have to be made as regards the Royal Flying Corps.

Aviation is undeniably of primary importance to the Army, and perhaps the Navy; but, owing to the conservatism of British Public Departments, the science has reached a stage of advancement out of proportion with its progress in the Services. Therefore, that the nation may not be wholly unprepared in the case of war, it is necessary to employ in our war forces, temporarily, at least, a number of civilian aviators of proved excellence. By the very nature of the science and the extraordinary fascination the idea of flying has had for the public imagination, aviators have been able to claim excessive sums for performances which a year or two ago took place under risky conditions. So it has been possible for an illiterate mechanic, if gifted with nerve and a good opportunity, to earn sums that would make even a member of a Liberal Cabinet blush.

The tradition of these payments, if not the reality, is still large in the minds of aviators, and, as I have pointed out, they also put a disproportionate value on the uses of the aeroplane. Consequently, when it is desired to employ such aviators as a part of an already under-paid Service, the determination of the correct scale of pay

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is difficult in the extreme. Only the other day a sedate and not unintelligent member of the community quite seriously suggested that aviators of a certain grade of efficiency—he named Mr. Hamel—should receive pay similar to that of a field-marshal, evidently comparing the amount such gentlemen might earn in private life with their value as a component part of an army in the field.

Wireless telegraphy is of high importance in the Navy. Mr. Marconi has a deep knowledge of wireless telegraphy. Yet Mr. Marconi's value as an individual wireless operator in the Navy would bear no comparison whatever with his value in the outside world. And the wireless operator, after all, bears the same relation to wireless telegraphy that the aviator does to aviation. He must be paid according to his value.

A Scale of Values.

A lieutenant's daily pay (we must take a lieutenant, as Colonel Seely has not yet made up his mind whether there is to be any distinction between second lieutenant and lieutenant in the Flying Corps) varies from 9s. in the Household Cavalry (sapper's pay *and allowances* reach 10s. 10d. per day) to 6s. 6d. in the Infantry of the Line. The Royal Engineer lieutenant can live in comfort on his 10s. 10d. a day, and he frequently comes of as good parentage as the most illustrious of aviators.

The scale of pay in the Flying Corps is much more generous. The flying officer (Army rank, lieutenant) is to receive daily 12s. The increase over ordinary Army pay is due to the necessity of direct entry. The hazardous nature of the duties is acknowledged by a further daily allowance of 8s. to all ranks of commissioned officers of the Royal Flying Corps. As Colonel Seely said, the corps is a highly favoured one, though certainly not *the corps d'élite* of the British Army. That title will remain the prerogative of the Household Cavalry and the Brigade of Guards until monarchies cease to be and the world is a debating society. The surest way to bring ridicule to a corps is to speak of it in exaggerated terms of praise. And ridicule has a curious power even in the gloomiest of countries.

Adequate arrangements have been made for the bestowal of pensions on those officers who receive serious injury during the course of their service. Similarly, the widows and children of officers killed or dying "within seven years as a result of injuries so received" will receive pensions, as do the relations of officers killed in action. Some annoyance has been expressed that officers of the Royal Flying Corps do not receive pensions after a certain period as do officers in the Army and Navy. It must be remembered that such Flying Corps officers as are seconded from the Army and Navy receive in due course their ordinary service pensions. The other officers of the Royal Flying Corps, being civilians, are merely engaged for a short period for special service. It is doubtful whether the War Office have serious intentions of employing civilian aviators on the permanent staff, but if they are so employed it will probably be purely a temporary expedient. Expediency is the source of many strange actions.

The Royal Flying Corps and the Civilian.

BY E. V. SASSOON.

If a foreigner had left after hearing Colonel Seely's opening speech at his meeting with the pilots and members of the Royal Aero Club at the House of Commons, he might have left under the impression that the Government had at last decided to grapple with the question of aviation as an important factor in our scheme of national defence from a practical point of view, and was not simply, as hitherto, doing the minimum possible at the minimum expense to make out a *prima facie* case that would silence those annoying critics who seem to think that an efficient army and navy is of more real service to the country than even an incomprehensible undesired Insurance Act.

But if Colonel Seely's hearer had waited till the end of the meeting, and had afterwards studied the Memorandum which was supplied him, any fears he might momentarily have had would have been speedily lulled to rest. It was not, however, till towards the end of the meeting that the game was thoroughly given away in answer to a query as to how it was to be expected that the civilian pilot should, besides carrying out the aviation training proper, also master in his four months' course the additional subjects of meteorology, photography, signalling by all methods, and instruction in types of warships of all nations, etc., etc.

Colonel Seely tried at first to brush the question aside on the score that proficiency in all the subjects would not be a *sine qua non*; but, on being pressed for the reason of their insertion in the Memorandum, drew the attention of his questioner to the phrase: "The training to be carried out *should* include." According to Colonel Seely, the blessed word "should" leaves General Henderson's Committee free to enforce the additional subjects or not, as they may think fit. It is consequently interesting to note that the memorandum only states:—

(1) That the military wing "should" consist of a number of squadrons (though it may, as at present, only consist of five more or less modern planes, and eleven obsolete ones).

(2) Candidates accepted as members of the Royal Flying Corps "should" receive the sum of £75 (General Henderson need no longer be despondent at the thought of this sum being paid to candidates who may prove unsuitable).

(3) Officers "may" be required to get the Royal Aero Club certificate privately (I should therefore suggest that proprietors of schools of an optimistic nature should think twice before investing largely in extra school machines).

(4) The reserve "should" be as large as financial considerations will permit—in fact, we are to be satisfied with the statements on page 1 of the Memorandum, that

(5) The organisation "should" provide establishments adequate for our present requirements; and

(6) "Should" be capable of absorbing and utilising the whole of the aeronautical resources of the country.

Yet even if all the "shoulds" in the Memorandum were "wills," the position of the civilian on either the permanent side or the First Reserve is no tempting one. Having applied to pass the course, and afterwards having applied to join a wing permanently, and having been accepted, he will find himself, on passing the course, and on being regarded as suitable, appointed for four years to either the Naval or Military Wing. He may be a first-class pilot, but as he obviously will not have the technical military and naval knowledge of his fellow-pilots drawn from the Services, he may find himself under the orders of a vastly inferior aviator to himself.

At the end of these four years he may be re-engaged from year to year, but he is liable at the end of any year after the fourth to find himself under the necessity of starting a new career. His service with the Flying Corps has led to nothing. The fact that he is expert in observing troops from an aeroplane, or signalling, will not help him to get as good a situation in an aeronautical business as he could have had if he had started on the commercial side at the beginning.

Now, let us take the position of a civilian wishing to join the First Reserve. Colonel Seely informed us that he would have to pass a course at the Flying School. The Memorandum states that the Expeditionary Force alone will need 378 pilots. The training of these, without allowing any percentage for those suffering from injuries, loss of nerve, etc., would take over two years, at 180 pupils a year. As it is proposed to also train forty naval men a year, we find that from three to four years will be necessary for training our war establishment before we can begin to think of a reserve. I am afraid that Colonel Seely's offer of a course of instruction at the Central Flying School for First Reservists is very remote, unless the pilot is possessed of his own plane, and takes it down to the Central Flying School.

As regards the lower grades, I can see no inducement for a first-class mechanic, now earning £2 10s. to £3 10s. a week, leaving his present employment to enlist at 4s. per day.

The scheme can only appeal to a man of independent means, who is willing to give four years of his life to the State, instead of loafing about town, or who already owns a plane and will join the First Reserve from a sporting point of view, or else who is employed by one of the aeronautical firms who may wish to put some of their employees in the position of keeping them up to date with the needs of the Services.

But for a pilot, however good he may be, who has to earn his own living, the scheme can have no attraction, as, unlike the Service man, he has no regiment or ship to which to return

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after his four years' service is over; and even if he thinks of joining the First Reserve solely to have the flying he cannot now afford, he will find that as he has not a plane of his own, he may as well spare himself the trouble of applying.

If Colonel Seely wishes to make his scheme a practical one, let him draw his war establishment entirely from the Services. Let the time spent in the Flying Corps count as double time towards pension. Let him appoint officers to each large aerodrome to give the required courses to prospective reservists, and let him attract civilians to the First Reserve by making arrangements with the private schools and manufacturers to keep an adequate supply of modern up-to-date planes in good flying order, which will be always available for the quarterly training. But let each reservist pass one quarterly training per year with the Army or Navy wing, to increase his military knowledge.

In this way the reserve will be a practical corps, and we will have a supply of modern machines available for purchase in times of war.

One last point I should like to bring to Colonel Seely's attention, and that is that though it is true that four years' continuous flying have been sufficient in the past for the average man, the strain of flying is daily lessened owing to the improvements in modern machines, and we shall find pilots capable of remaining on the active list a great deal longer as time goes on.

The scheme as now outlined and explained by Colonel Seely will prove entirely unworkable, as not only will the civilian element not be attracted to the Reserve, but the efficiency of the Permanent Force must be impaired by the friction that is bound to take place between the military and civilian elements.

French Military Aviation.

It will be remembered that on April 18th M. Millerand, Minister of War, reviewed the aeroplanes attached to the military aviation centre of Saint Cyr. On April 29th he inspected the aviation camp at Mailly. He arrived at Mailly early in the afternoon, accompanied by General Manoury (Military Governor of Paris), General Joffre (President of the Council of War), General Goetschy, G.O.C. 20th Army Corps; General Perruchon, G.O.C. 6th Army Corps; General Chatelain, Inspector of Field Artillery; Colonel Hirschauer, Inspector-General of Aeronautics; Lieut.-Colonel Estienne and Capt. Maris.

The officers of the centre inspected were Capt. Barès, commanding the escadrille, Commandant Felix, Capts. Echeman and Michaud, Lieuts. Battini, Varcin, Migaud, de Rose, Lelièvre, Bordage, de la Morlaye, Challe, Vaudein, Chabert, Chevreau, de Goyer d'Orth, and Gouret, Sub-Lieut. Ménard, and Sapper-Aviators Brégi, Irat, Tabuteau and Seguin. The aeroplanes examined were two Bréguet biplanes, two Henry Farman biplanes, five Maurice Farman biplanes, and six Blériot monoplanes.

M. Millerand decorated Lieut. Chevreau and Sub-Lieut. Ménard with the Cross of the Legion of Honour, and presented Sapper Brégi with the Military Medal. After several flights made by different officer-aviators, M. Millerand left the camp. He was highly pleased by the efficiency and condition of the centre.—W. E. de B. W.

Austrian Army Aviation.

Lieut. Ritter, of the Austrian Army, has flown over the Semmering Pass in an Etrich monoplane, starting from Wiener-Neustadt, near Vienna, and landing at Gratz, the capital of Styria, doing the distance, of about 100 miles, in two hours.

The Semmering is the easternmost and lowest of the passes over the main chain of the Alps, and is about 3,000 ft. above sea level. It is of great strategic and commercial importance, as all the traffic between Vienna and the Adriatic and Italy passes over it.

Lieut. Ritter flew about a thousand feet above the pass, but was, nevertheless, much thrown about by the disturbed mountain air.

German Naval Aviation.

It has quite recently come to light that an Albatros biplane has flown from Heligoland to Germany. The flight was noted in a German paper, but promptly suppressed, and the British papers never got hold of the news at all, or, if they did, ignored it through their usual inability to estimate relative values. The event is of very great importance. In the first place, the Island of Heligoland in the North Sea, some 50 or 60 miles from the German coast, was formerly a British possession, but was ceded to Germany by the late Marquess of Salisbury. It has since been turned into a German naval base.

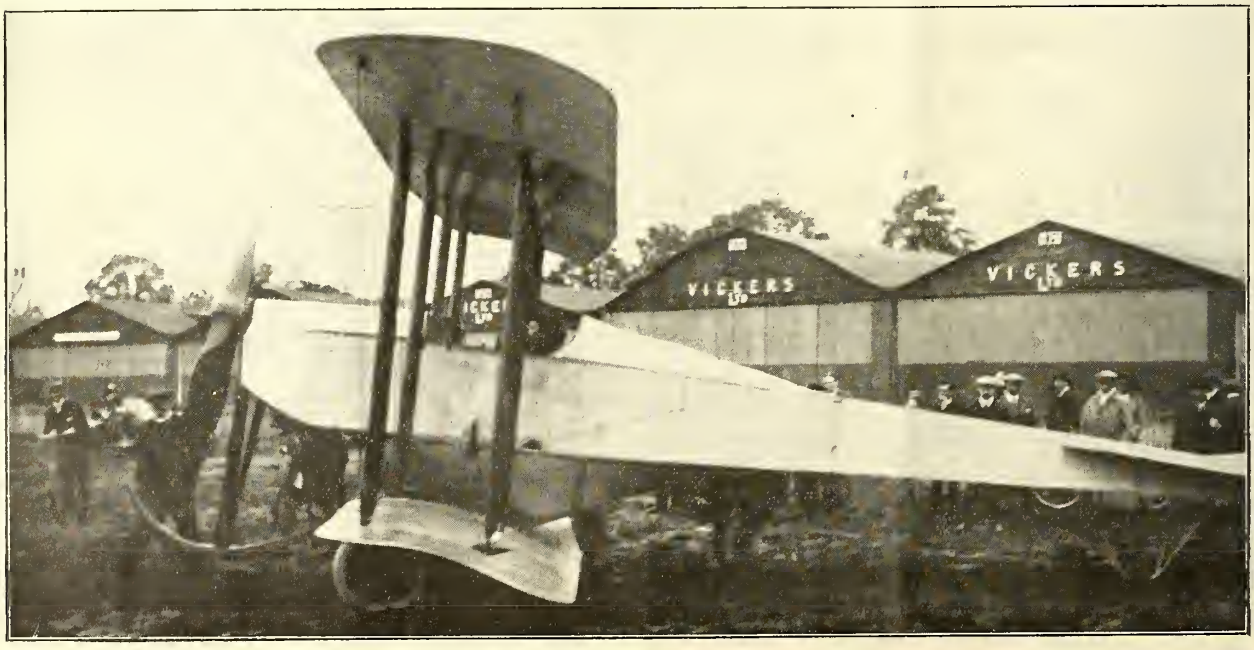
It will be remembered that Heligoland was, till lately, the finishing point of the yacht race from Dover for the Kaiser's Cup, but since the present German naval programme was undertaken the presence of British vessels near Heligoland has not been encouraged.

The recent flight is definite proof that Heligoland is being used, at any rate experimentally, and certainly with intentions for future development, as a base for naval aeronautic work, which will include big dirigibles as well as aeroplanes.

It is therefore worth remembering that, even with aeroplanes of the present day, Heligoland is within flying distance of our eastern ports from Grimsby to the Moray Firth, and that in a year or two it will be merely a comfortable flight from Heligoland to our naval base at Rosyth in the Firth of Forth and back.—C. G. G.

Continental Notes.

Enseigne de vaisseau Delage is experimenting at Meulan on the Seine with a Nieuport monoplane fitted with floats.



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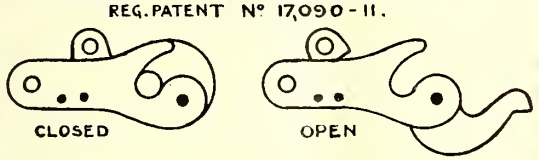

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M. Paulhan, with that instinct for business for which he has always been notable, has now made arrangements to hire out "sumptuously equipped" hydro-aeroplanes with skilled drivers to those who desire to make lengthy aerial voyages.

Mr. Gordon Bell has during the last week or two been making many flights in the vicinity of Constantinople on a R.E.P. monoplane. On the occasion of the Sultan reviewing the troops he made a long flight over the Bosphorus and the Golden Horn. He landed finally at the aerodrome of San Stefano.

The last day open for attempts on the Coupe Pommery was April 30th, and three pilots made long flights in the hope of winning it. Mr. Hamel and his passenger, Miss Trehawke Davies, flew from Boulogne-sur-Mer on a 70-h.p. Blériot to Antony, a little hamlet near Paris. He was compelled to give up owing to the high wind—a wind which the other competitors escaped by starting earlier in the morning. Bedel, on a 50-h.p. Morane-Saulnier, left Villacoublay at 4.51 a.m., and arrived at Biarritz at 5.45 p.m., after stopping at Tours, Angoulême and Bordeaux. Prévost, flying a 100-h.p. Deperdussin, left Nancy at 5.30 a.m., and landed at Les Sables d'Olonne in the Vendée at 2.50 p.m. M. Bedel, having flown the longest distance in a straight line in the course of one day, is the winner of the Coupe Pommery.

The *Prix Deutsch (de la Meurthe)* for the fastest circuit of Paris, by Saint-Germain, Senlis, Meaux, Melun, and Saint-Germain again, is now held by M. Hélén. He flew the circuit on a 70-h.p. Nieuport in 1 h. 35 min. at a speed of 126 kilometres an hour. This prize, which is international in its regulations, is to be held by the pilot who beats the previous holder's time by 1-10th. The first holder, who, of course, set up the time, was Maurice Tabuteau, who won it a fortnight ago on a Morane-Saulnier. His time for the circuit was 1 hr. 47 mins. Hélén made an earlier attempt, but owing to engine failure landed in a suburb of Paris, somehow getting down without damage in a ground which was being prepared for a tennis club.

On May 2nd Védrines, who is rapidly recovering from his reported death of last week, was decorated with the Cross of the Legion of Honour. Colonel Hirschauer, Inspector-General of Aeronautics, performed the ceremony. M. Védrines is, of course, still unable to leave the Lariboisière. In reply to the official congratulations, the aviator said: "I have perhaps won this cross by my past performances, but certainly not by my last one."

There will be an Aviation Week at Johannisthal beginning on June 24th. The Emperor himself has bestowed a prize for the highest altitude attained by a German aviator. The general prize money amounts to 40,000 marks.

Georges de Robillard, Comte de Robillard-Cosnac, was killed on Saturday last while flying an Antoinette monoplane. He has for some time been flying this machine near Nice, and at four o'clock on Saturday he left the *Aerodrome de la Californie* to visit his friend Garbero at Antibes. The wind was rather high, and his flight was one of difficulty. He succeeded in reaching the aerodrome of Antibes and began a *vol plané*. According to the somewhat meagre accounts which have reached me a wing collapsed, and he fell vertically to the ground, striking the telegraph wires on the way. When those who were watching reached him he was dead. The Comte de Robillard was born at Nice, July 18th, 1884. His aviation experience began in the early months of 1910 at Mourmelon, first under the tutelage of Charles Wachter, and later under Laffont, both of whom have joined the Great Majority. He took his certificate (No. 184) on August 29th in that year, and a week or two after flew in the manœuvres. The old names are fading and the new can never hold the same charm. The Antoinette, the most graceful of aeroplanes, is seen no more, and its greatest pilots, with the exception of the greatest of all, have gone to their death. Commerce had no part in the life of De Robillard, and he died in the manner he would have chosen. A few words in the newspapers and a few haunting regretful memories in the hearts of friends are the requiem of a gallant gentleman. That is all.—Pingouin Rose.

An Aerial Log.

Miss Trehawke Davies, who has been doing so much flying with Mr. Hamel, has kindly lent The Aeroplane the notes she made during their recent journey from Canterbury to Paris in very bad weather. These notes are a remarkable proof of the utility of the latest type Blériot for scouting purposes, for Miss Davies' references to trains and boats shows that she had a clear view of the ground. This new two-seater is a tandem machine, with the wings set very far back, so that the pilot has a clear view down past the front of the wings. To balance him, the passenger is placed far back in the fuselage, so that he—or she, in this case—can see down past the trailing edge of the wings.

Miss Davies' log reads as follows:—

April 29th, 1912.—Left Canterbury 5.32 p.m. Very bad shakings; literally tossed from side to side; exciting. Bad storm cloud ahead; face-stinging wind. Hope it will be smoother flying over Channel; rainbow in distance on right

Miss Trehawke Davies and Mr. Hamel on the new military Blériot. The passenger has a clear view vertically downwards.

looks like a whole hoop instead of an arch. Very cold. Pencil blown over plane. Over the sea 5.50 p.m.; smooth but hazy. Several steamers, tugs, fishing-smacks about. Passing through small light clouds; peculiar green colour of currents on the grey surface of water. Steering through white mist; intense cold; low-lying clouds under; good to see coast of France again; weather seems better over that side, but still misty.

6.3.—Flying along coast line; wish I could have gauged our altitude crossing. Got a mouthful of castor oil then. Waved to steamer just under on right; raining or hailing? (Poor Mr. Hamel!) Sounds like peas on the plane. New experience this, moon high on left, sun low on right. Pelting hard. Very glad wind behind and not in front. Planing down 6.14 p.m.

April 30th, 5 a.m.—Left Hardelot Plage. Fine morning. Strong wind, N.E. Rather cold. As usual, much regret being unable to see maps or altitude recorder. Castor oil spurting; raining as well. Hope latter will wash former from glasses. Sun shining brightly on left, at same time haze in front. Following railway line as before; side wind catches page, almost tears it out of book; rain stinging face, flayed feeling distinctly unpleasant. The "70" so responsive that slight *remous* whenever Mr. Hamel wipes his glasses. Looks like more rain ahead. Caterpillar-like trains. Stiff wind. Wish knew where we were; no bump of locality; fool at topography, so can make no notes worth recording. More goggle-wiping *remous*. Still raining and castor-oiling hard; trifle tired of both. Hope it will be warmer later on "down South." Mr. Hamel and I both tried to wipe glasses at same moment. I nearly fell out, and only made glasses blurred.

6 a.m.—Slight forest *remous* despite altitude; much mist ahead. Rain clouds; seems fine day down below though. Violent gust nearly tore page in two. Wonder where on (no, over) earth we are? Must be Beauvais. Planing down beautifully 6.15 a.m. [Boulogne to Beauvais is 180 kilometres, or about 110 miles, covered in under 75 minutes, so there must have been a 30-m.p.h. wind.—Ed.]

Beauvais.—Leaving ground 7.25 a.m.; much wooded country, bad *remous;* side to side swaying like leaving Canterbury yesterday. Nasty wind, rather nerve-trying; exciting, giving Mr. Hamel my handkerchief thousand feet up. Pitching wildly, *had* to hold on then. Plane tossed about all ways at once, it seems; why instinct *to hold on?* It wouldn't really make any difference. Psychologically interesting that, irrational but instinctive. I suppose must be at very good altitude now, seems tremendous height up; ghastly *remous* again. The motor can't stand much more of this, surely. Mr. Hamel marvellous.

7.50 a.m.—The last fifteen minutes one might truthfully describe as *un mauvais quart d'heure,* and it's still going on! Worse and worse, pitching, rolling, tossing by turns; thick haze ahead; can't see country; getting an appalling shaking; can only write at intervals. Nearing Paris. Mist; can't see Sacré Cœur—never can—Eiffel, Pont d'Alexandre, passing Ile de la Cité, or is it Ile de St. Louis?—don't know, difficult to see at all. Castor oil now; can't write, rocking terribly. Planing down 8 a.m., Antony (Seine).

[Here the journey was stopped owing to the wind.—Ed.]

The Aviators in Africa.

Writing from Kimberley on April 5th, Captain Guy Livingston says:—"We are down in Kimberley now, having finished up in Johannesburg some little time ago. The flying there was quite successful, Driver getting to a height of 3,500 ft. above Johannesburg, and Pat. to about 3,000 ft. On the last day of the meeting, Paterson flew right over the town, which caused a considerable amount of excitement.

"As you have doubtless heard, Driver had a bit of a smash just before the end of the meeting. It was really partly an error of judgment, as he was planing down too steeply, and came into the racecourse cross-ways instead of length-ways, with the result that he had no room. He tried to turn, and, when the plane banked, one wheel hit the ground and she turned over. The smash was pretty bad financially; but we have repaired her again, and she is now as good as ever.

"Paterson gave a very good exhibition here on Wednesday, and the boys are both flying again on Monday, when they start off on a trip to Warrenton, Bloemhof, Maquassi, Klerksdorp, Potchefstroom, and back to Kimberley, about 450 miles."

Writing from Kimberley on April 15th Captain Livingston says:—"I expect you have seen the cables of Pat.'s flight to Klerksdorp from here, but I am just writing you a line on the subject. In my opinion it has been one of the hottest flights that has ever been done.

"He started away from Kimberley about 7.15 a.m. last Tuesday morning in biting cold and flew to Warrenton, 52 miles, beating the train I was on by 42 minutes, and then on to Christiania, Bloemhof, Maquassi and Klerksdorp, his total flying time for the whole journey, about 210 miles, being 4 hrs. 42 mins.

"The wind on the veldt all the time was very strong, never less than 20 miles an hour, and there were pockets all over the place. Passing over Windsorton Road, he was about 2,500 feet up and dropped nearly 300 feet.

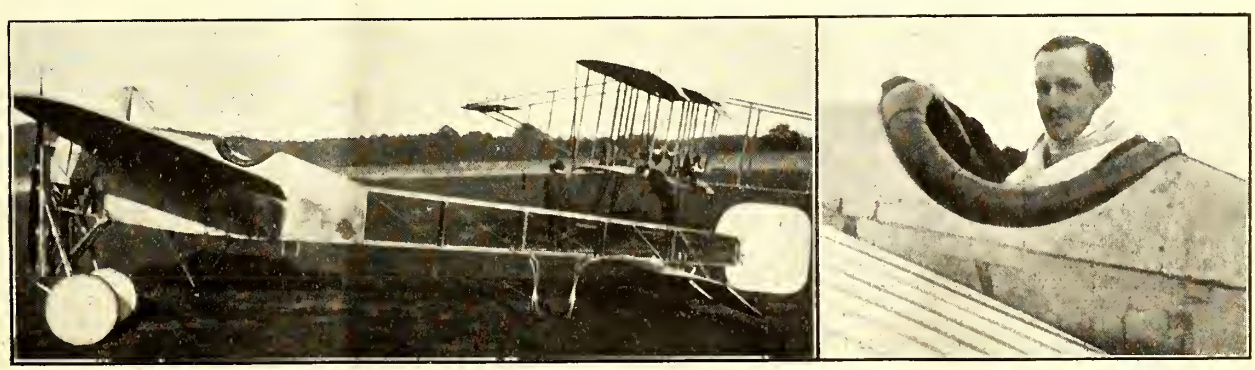
"On his way back he gave the Cape Mail train 35 minutes' start from Klerksdorp and arrived at Maquassi 34 minutes before the train. The distance is 56 miles. As he overtook the train he came down to about 20 feet and flew alongside. General Hart, the G.O.C., was on the train, and he seemed to be very impressed.

"The way Pat. handles this biplane of his is marvellous, and he has been closely studying the local conditions here, with the result that we are going to at once start building a new type of machine specially for Africa, as there are many modifications necessary for the local conditions. Pat. has the drawings, and I think this machine will be a big success here. I am firmly convinced that the monoplane is not suitable for Africa, although I was not of that opinion when we landed."

[Naturally, these splendid performances having been done by a British subject on a British machine in a British colony they have been studiously ignored by the British Press. If they had been done by a second-rate French flier on a French box-kite in Cochin China, or Morocco, they would have been handsomely paragraphed in all the English papers.—Ed.]

Mr. John L. Weston, who was the first South African to take his certificate, writes that he has just returned to Brandfort, after a flying tour in Cape Colony. During the winter he intends going on a lecturing tour, and devoting himself to spreading interest in aviation. It is a pity we have not a few such earnest workers in this country.

Mr. A. R. Howe-Browne, writing from Umvuma, Rhodesia, says that at present there is no aviator in Rhodesia, but he learns that a Mr. Carter, who has been experimenting with aeroplanes for some years, and who is said to have made flights with a low-powered engine at Johannesburg, is going to fit a more powerful engine and bring his machine to Bulawayo. He also says that a committee have been got together to consider the possibility of forming an Aeronautical Society in Rhodesia, and to consider arrangements for flying meetings in Bulawayo and Salisbury.



Mr. Moorhouse and his cased-in Radley and Moorhouse monoplane.

The House of Commons Interview.

On Tuesday, April 30th, Colonel Seely, Under Secretary of State for War, and Brig.-Gen. David Henderson, D.S.O., the Chairman of the Committee which is at present organising the Royal Flying Corps, received at the House of Commons a number of aviators and members of the Royal Aero Club. Sir Charles Rose, who introduced the visitors, said that Colonel Seely had kindly consented to meet them and explain the object and composition of the Flying Corps. This was in no sense a deputation, but the Committee of the Royal Aero Club had thought well to convene a meeting of pilots to discuss the official Memorandum, and to encourage them to offer their services. He believed we had ample material for pilots and mechanics, and if encouraged we were able to make the Flying Corps equal to that of any foreign country. He pledged all members of the Club to assist Colonel Seely in his scheme.

Colonel Seely thanked the Club for their promise of support and said that he was glad to meet them face to face, as was General Henderson, to whose energy he wished to bear witness. The question to be asked was, What would happen to anyone wishing to join the Royal Flying Corps? The Corps was the one organisation in the country formed to further national aviation, and he remarked on the honour done to it by the King in conferring on it the title of Royal. It was longer than anyone could remember since that title had been given to any branch of the Services.

Referring to the Memorandum, he said the instructions to anyone wishing to join the Corps were that they should write to the Commandant of the Central Flying School, but as that appointment had not yet been made, they should first write to General Henderson at the War Office. If selected, the applicant would go to the Central Flying School, there to study progressive flying. He did not suggest that such fliers as Messrs. Grahame-White, Barber, or Cody needed to learn cross-country flying, but they would need to learn to distinguish between wagons and artillery, mounted infantry and cavalry, but in their cases the period of training would be greatly shortened. If the applicant was accepted by the School, he would get his £75 bonus the same as regular officers who took their aviators' certificates, and if he passed the School he would be appointed on probation to the Flying Corps. If he were afterwards appointed as a permanent member of the Flying Corps, or of the First Reserve, he would have a £40 outfit allowance. If he wished to become a permanent member he could join either the Naval or Military wing of the Central Flying School, as and when a vacancy offered. The pay was not much, but it was much more than that of a second lieutenant in any other Corps.

He had been asked what were the prospects at the end of the four years' service. He could not now say, but service might go on from year to year, or an officer could join the Reserve, but he could not demand employment under the State. It was very probable that the Flying Corps would become a very important service with subsidiary branches and would give employment, in some way not as flying officers, to officers who had served their four years. In any case the officer who did well would be specially noted for service under the State.

As to the obligation undertaken by anyone joining the Corps, they would be required to serve in any part of the world in emergency in the same way as in the Special Reserve. It had been suggested that it might be better if they were only required to serve in Great Britain in the same way as the Territorials, but he believed there should be one Corps ready in the hour of emergency for over-sea service. The Corps might be very important on a ship at sea, for wireless was of no value as a scout, whereas a flying man at a height of 2,000 ft. could survey 10,000 square miles of sea. If civilians joined the Corps for Home Service only, their activities in this way would cease at the three-mile limit.

An applicant, after passing the School, might prefer to join the First Reserve; he would then get £75 bonus and the £40 outfit allowance and a small retainer. His obligation would then be to do nine hours' flying each quarter, otherwise he would have plenty of time to follow his usual avocation. If his nine hours' training was not done in ordinary aerodromes, the State would provide facilities, and he could use his own machine if it were approved by the Commandant.

Members of the Second Reserve would have no retaining fee and would not be required to do practice flights, as they would be accepted by the Commandant as competent fliers after passing from the First Reserve. These rules were not hard and fast, but the scheme would develop along these lines, and when the Corps was complete it would be a *corps d'élite* of the Imperial Service. As regards civilians in the Colonies, they were anxious to work with the Colonies in this matter and hoped to embrace the whole Empire in the scheme ultimately.

The Discussion.

In the discussion that followed, Mr. Sassoon pointed out that considering the number of pupils allowed for in the present scheme of training, with 180 pilots to be acquired for the permanent establishment and 100 planes for their use, it would take four years to get them through, so that the present estimates allow for no civilians at all. The Memorandum mentioned civil aerodromes for training purposes, and he suggested that an instructor should be appointed to each for supplementary subjects, such as meteorology, aerial photography, and so forth. He also suggested that for the nine hours' qualifying flights modern planes should be used, and that obsolete, slow, school machines should only be permitted for taking certificates. This would have the advantage that, as new planes would be in constant use, modern planes would be available in time of war. He felt sure that civilians would join the Corps if they could get their expenses paid, and that support would be forthcoming from those who had not yet learned to fly and those who had given up flying because of the expense. It would be necessary to guard against sending candidates to inadequately equipped schools where the machines were badly cared for and obsolete.

Mr. Cody wanted to know whether, if an individual took his own machine to the Central School, he would be allowed to bring it home afterwards, and who would pay for repairs. Colonel Seely replied that the State would pay for repairs and the individual could take his machine home.

Mr. Valentine asked whether if a member of the Corps took his own mechanic to the Central School what the position of the mechanic would be? He was told that they would endeavour to enlist the mechanic in the Corps also, otherwise he would be in the position of a private servant, though presumably on duty from 4 a.m. to 6 a.m. The question was one which needed consideration.

Mr. Percival inquired what age applicants needed to be. Colonel Seely said that he would not commit himself to a figure, but they would only be accepted if efficient for cross-country flying.

Mr. Barber raised the question of married men, and was told that marriage was no bar.

Mr. Perrin asked whether if a private machine was smashed the owner could have a new one, and was informed that owners would be indemnified, but that the Commandant would not accept any but sound machines in the first place.

Sir Charles Rose inquired as to the minimum time of practice flights, and whether a man could do his nine hours in short flights of ten minutes at a time. Colonel Seely said that full regulations would have to be issued on this point.

Mr. Barber suggested that there should be a minimum altitude regulation, and was told that this was included in the cross-country qualifying flight.

Mr. Pizey inquired whether a pilot received a pension if smashed up, and it was pointed out that this was allowed for in the pay warrant.

Captain Wood inquired whether an officer of the Special Reserve joining the Reserve of the Flying Corps would be seconded. Colonel Seely said that in any case the Flying Corps would have first call on his services.

Mr. Grahame-White wanted to know what happened when a man applied to join the Corps. Colonel Seely said that if not selected he would be told so, and if selected he would be directed to join the Central School on such and such a date, the first period starting from August or September next. The applicant's convenience in the matter of time would be considered as much as possible, and if already known to be a good flier, he could go to any of the military wings for his training, but ordinary fliers would have to go to the Central School.

Mr. Grahame-White suggested that the nine hours' flying a quarter was not enough to keep a really enthusiastic flier up-to-date in new types and new controls, and asked whether such a man could go to the Central School for further practice whenever he liked. Colonel Seely said that this point must be arranged. Mr. Grahame-White also wanted to know what would happen with a man who is always smashing machines. Colonel Seely said that probably the Commandant would turn him out, whereupon Mr. Grahame-White suggested that a

man might for practice do all his flying in windy weather, and smash a great many machines, and ultimately be much more valuable in time of war than a man who always chose calm weather for practice.

Mr. Bettington wanted to know whether the nine hours' practice could be done by simply flying round the aerodrome at the pilot's own convenience, and whether he ought not to do this practice flying over troops and sending in a report afterwards. Colonel Seely said he did not want to make the conditions too stringent, and a pilot must qualify for scouting and reporting at the School before joining the Reserve.

Mr. Bettington also raised the question of pay, and of pension after four years' service, followed by perhaps four years' extra service. He was told that a pilot would get full pay when gazetted, and during tuition at the Central School would get second-lieutenant's pay plus 4s. a day. The question of pension had not been settled and at present it was not intended to make the Flying Corps a pensioned service. It was thought that after experience in the Flying Corps an officer would be valuable for civil employment.

Mr. DelaCombe raised the question of young men joining the Flying Corps. He pointed out that he had a son who was of an age to join and wished to know whether there were any prospects supposing he served from the ages of 19 to 23 in the Corps. If there were no prospects there was no temptation for young men to take up flying as a profession or life career. Colonel Seely said that at present flying in the service of the State was not a pensioned profession.

Mr. Bettington asked Colonel Seely direct whether he would advise a young man to go direct into the Flying Corps or whether he would advise him to go first to Woolwich and join the Flying Corps as soon as he passed out. Colonel Seely said that this was a case for private discussion.

Mr. Grahame-White raised the question whether commands would be in the hands of qualified men, for the Royal Aero Club certificate tests were of little use, and he would be sorry to be commanded by some of the aviators holding certificates. Colonel Seely assured him that all commands would be given to men of special knowledge.

Mr. Gates wanted to know what use the Second Reserve would be if the members were not bound to do any flying. Colonel Seely said that they were a good deal better than nothing at all, because they had to show that they could fly before being appointed, and one could not complain if they did nothing because they got no pay.

Mr. Cockburn pointed out that there was not enough encouragement for first-class mechanics to enlist in the Corps, and was assured by Colonel Seely and General Henderson that this question would be considered very carefully.

Mr. Percival asked whether those who pass at the Central School would have the option of choosing which wing they would join, and whether, if not passed, they would get the £75 bonus. He was told that no one would be appointed against his will, and that under the present regulations applicants would get their £75 when they went to the Central School without waiting to be passed out of it to either wing.

Mr. Pizey asked whether an aviator's views as to whether a machine be safe to fly or not would be respected, and whether he would have to fly a machine which he did not like. He was told that no one would have to fly a machine to which he objected.

Mr. Perrin asked whether those at the Central School would have to pass a set examination on the supplementary subjects, and was told that they would have to satisfy the Commandant as to their knowledge.

Mr. Bettington, referring to the learning of signalling, asked whether a man who was a good man otherwise would be disqualified if he could not learn the Morse code. Colonel Seely pointed out to him in the Memorandum the blessed word "should." Mr. Bettington also asked how promotion would go, and was told that it would be entirely by merit.

Mr. Hucks asked whether officers on the permanent establishment would be stationed in England only, and Colonel Seely said that for the next year or two, at any rate, they would be stationed at home, but as the Service expanded they might be sent anywhere.

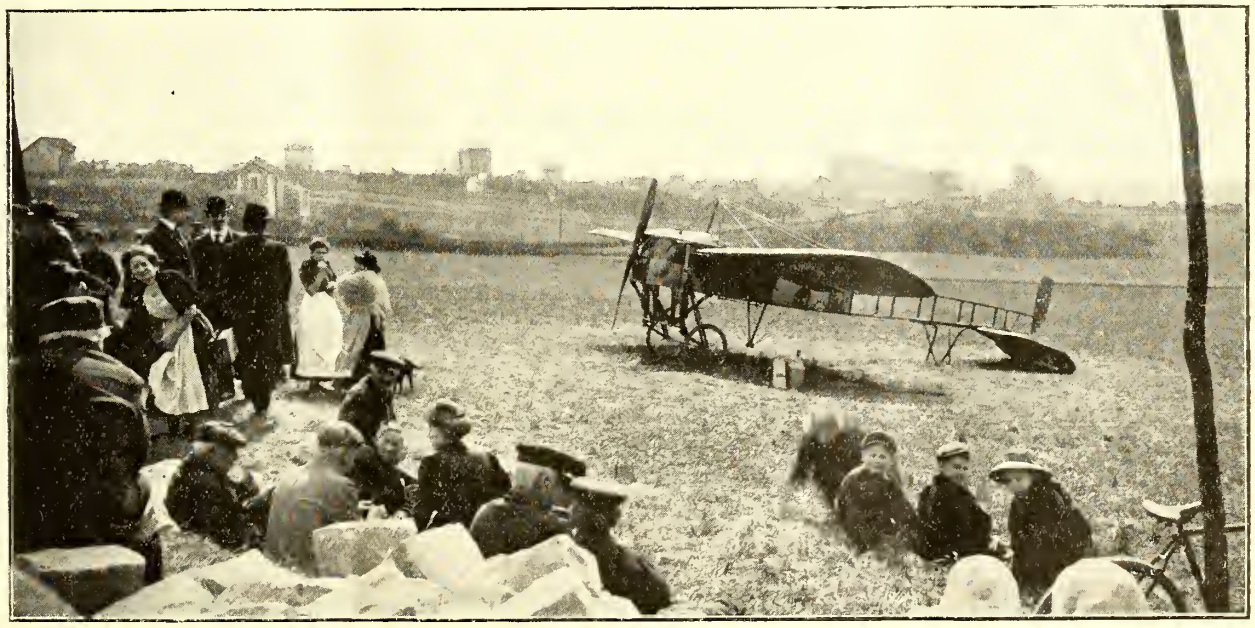
Mr. Wallace then closured the meeting by expressing his gratification that the views of the Royal Aero Club Committee, of which he had had the honour to be chairman, had crystallised into the scheme before them.

Some New Moves.

Mr. Sidney V. Sippe, who incidentally has the honour of being the only civilian hydro-aeroplanist in this country to have flown off or on to salt water, has gone to France this week to learn to fly an Hanriot at Reims, and it is possible that on his return he may definitely join Hanriot (England), Ltd., the new firm which Mr. Ducrocq has now started to work at Brooklands.

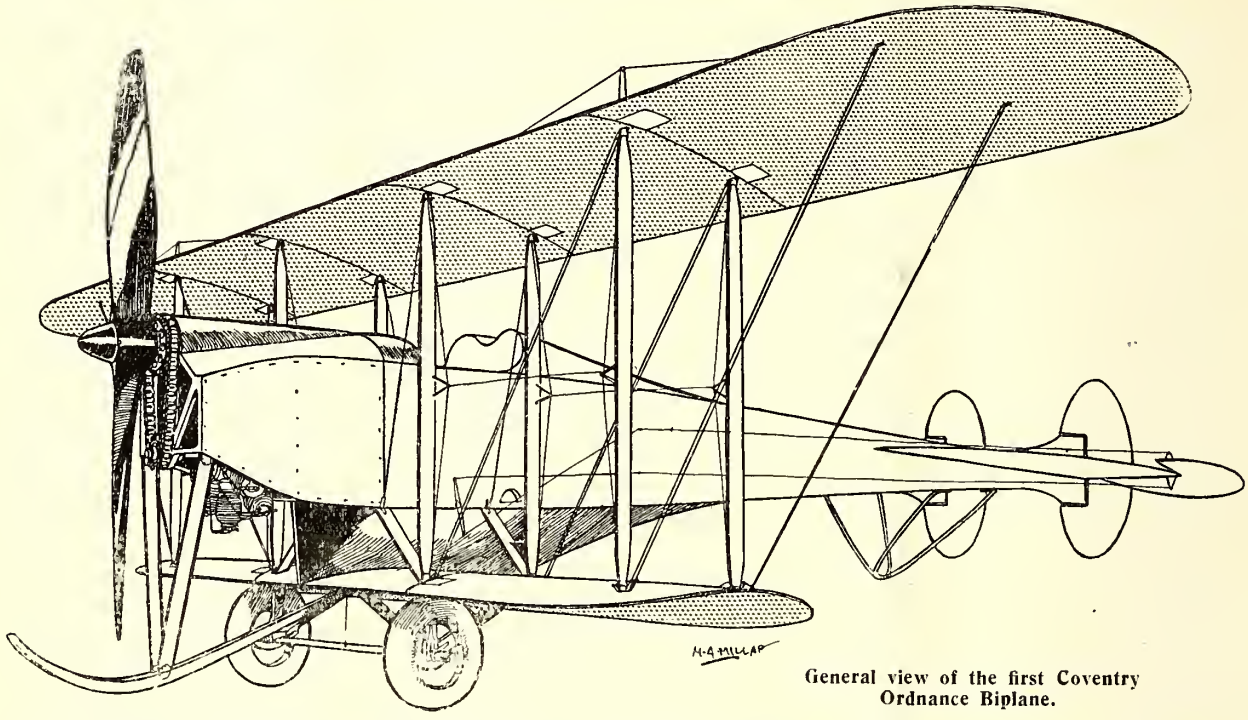
Mr. H. Petre leaves the British Deperdussin Company at the end of this week, and will doubtless be heard of in a new post ere long. His place will be taken by Mr. Clement Greswell, formerly of the Grahame-White Company, who should be a very popular addition to Brooklands.

Mr. Collyns Pizey has been promoted to charge of the head Bristol School on Salisbury Plain, *vice* M. Jullerot, who goes on a foreign mission for the firm. Mr. Pizey will be greatly missed by all at Brooklands, but it is hoped that he may be able to get over often for the week-end competitions. His place at Brooklands is taken by Mr. Hotchkiss, one of the best pilots and hardest workers in the Bristol firm, and he also is certain to prove an acquisition to the little community at the aerodrome.



Mr. Hamel's new military Blériot at Antony (Seine) after the flight from Hardelot. Note the low chassis, the short cowl, the raised rudder and the big tail and elevator.

The First Coventry Ordnance Biplane.



General view of the first Coventry Ordnance Biplane.

The new biplane for the Coventry Ordnance Company, which has just been built by Mr. Howard Wright to Mr. W. O. Manning's designs, is undoubtedly one of the finest machines yet produced in England or elsewhere. The original points shown in its design are too numerous to be dealt with in full detail, and, in fact, it must be seen to be appreciated.

The planes appear, considering the size of the rest of the machine, to be quite small, their surface being actually about 350 sq. ft. The chord tapers from 6 ft. to 5 ft., the span being 20 ft. for the lower plane and 40 ft. for the top plane, the "extensions" being 10 ft. each. The gap is very large, being 8 ft.

In plan form the wings are tapered, as noted above, and the tips are of what is usually known as the "Morane" type, i.e., the front corners are rounded to a larger radius than the back. The camber is one of the sections with which M. Eiffel made his experiments; for Mr. Manning considers that the advantage of knowing exactly how the planes will behave in use completely outweighs the problematical ultra-efficiency of a hitherto untried camber. In construction, the wings are immensely strong, being of what is usually known as "monoplane" design—double surfaced, with heavy ribs, I spars and internal bracing. The struts are very wide from back to front, and comparatively thin, being most ingeniously strengthened by special bracing. The main tie wires are doubled, and are of stranded cable about $\frac{3}{8}$ in. diameter.

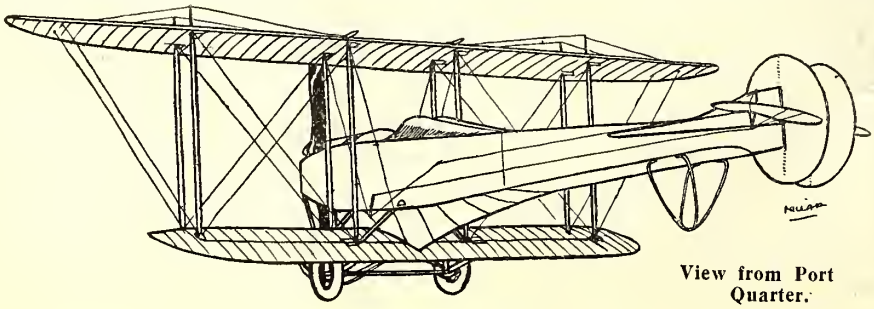
The strainers were specially designed for the machine, and the cables are attached to them very neatly, to allow quick dismantling. The cables are spliced round cast aluminium eyes, the splices being properly served with wire and then sweated up. The eye is held to the strainer by a special pin. This pin (which is shown in one of the sketches) is instantly removable, and at the same time is self-locking. The spars are hinged at the struts, and there is a very neat manhole for getting easily at the joints; this is shown in another of the sketches, where one can see the sliding plate which is let into the wing over the joint. There are only four pairs of struts in the whole machine: a pair near the tip of each lower plane, and two pairs near the body, which enclose the central cellule.

The extensions are braced above from small king-posts placed above the outer struts, to stand downward strains.

The fuselage is very large, being wide enough to enclose the 100-h.p. Gnôme engine. The actual depth is 2 ft., but there are various "superstructures" beyond this. The engine is slung slightly below the centre of the fuselage, and chain-drives the propeller. The nose of the fuselage is covered with sheet aluminium; an aluminium bonnet, something like that of a Sizaire car, covering it on top.

The pilot and passenger sit side by side in a cockpit, their heads just showing above the fuselage. Behind each of them is a tapered streamline, built on light hoops, and under the cockpit the fuselage covering is brought downwards in a kind of dewlap, enclosing some of the supporting struts and acting as a fin.

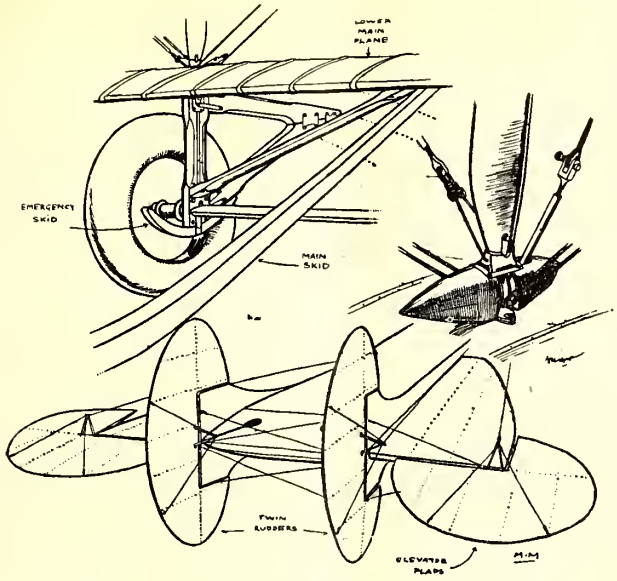
The fuselage is supported from the lower plane by four struts from each spar; two of these go to the bottom of the plane-struts, the other two meeting at the middle of the centre cellule, immediately above the skid. The fuselage holds its full width right to the tail, but tapers off top and bottom; the empennage is triangular, and is fitted parallel to the top edge of the fuselage. There are two balanced elevator-flaps.



View from Port Quarter.

The twin rudders, which are also balanced, are fitted in continuation of the sides of the fuselage. Each of them has in front of it a small fin.

The power plant consists of a 100-h.p. Gnôme engine, driving at half speed an 11 ft. 6 in. propeller. The engine is fixed in very carefully designed bearers, which also carry the bearings for the propeller-shaft. These bearers are fitted with 10-gauge liners to take up the specially heavy stresses set up when gearing down a powerful engine.



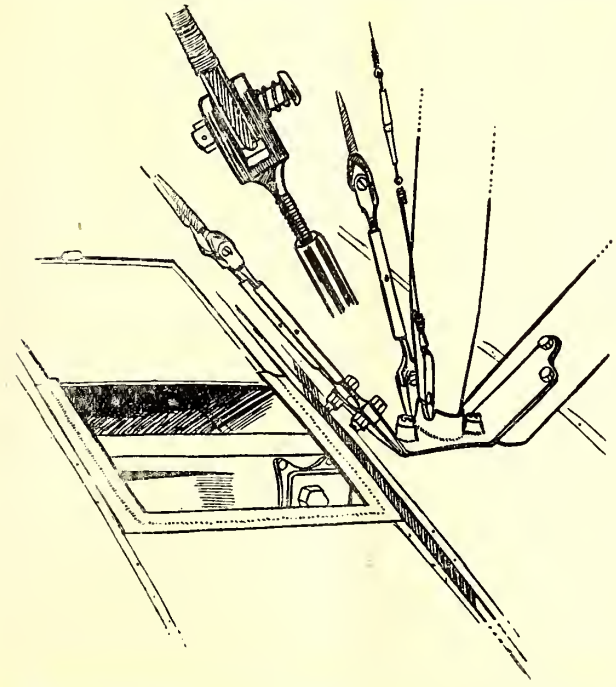
The skid arrangement, a streamlined pulley and the control planes.

The propeller is also of Mr. Manning's design, and is at first sight somewhat peculiar, as it reaches its maximum blade-width at about two feet from the boss, from which point it tapers to the tips. This propeller is designed to do no work for the first 18 in. or so of the blade, so that it does not deliver its slip-stream in the pilot's face. The pitch varies along the blade, but is somewhere in the neighbourhood of 11 ft. 6 in.

The control is of the wheel type, with foot rudder-bar; a notable point is that the warping cable runs direct from tip to tip of the planes, the wires from the control wheel being jointed on to it.

Only the "extensions" are warpable, but as their area amounts to about a third of the whole surface there is no lack of warping power. The pulleys for the warp wire are all placed in streamline casings. The rear king-posts on the upper plane are pivoted, so that they can follow the movement of the tips when warped.

The chassis is an example of that *sancta simplicitas* which



The inspection doors in the planes; the strut and stay fixings; and a quick-detaching bolt.

should be the engineer's ideal. There is one cross axle, at each end of which is a large wheel (28 in., I believe) with a 6 in. tyre. The axle comes under the front spar, and is strutted from both spars; the wheels come under the inner plane-struts. There is a central skid of hickory, which springs from the middle of the front spar, and is attached to two very strong struts springing from the front engine-bearer. At each end of the axle, inside the wheel, is a small tusk-shaped skid to prevent the axle from digging into the ground in case of a wheel breaking or coming off. There is a cross-skid of cane under the empennage.—P. K. T.

Its Trial Flights.

The machine made its first trial on Sunday last at Brooklands, and quite surpassed expectations. It must be remembered that it is the first example of quite a new type, and is, further, the first tractor biplane Mr. Howard Wright has built. After a little preliminary running of the engine, Mr. Sopwith, with Mr. Manning as passenger, set out to roll. After about 30 yards run, at a speed of about 25 m.p.h., the machine began distinctly to lift, so Mr. Sopwith brought the tail up and held her on to the ground till he got out into the straight, where he let the engine out a little and hopped down the ground. Coming back the machine lifted at once and flew properly, and, though the engine was quite untuned and the planes merely assembled to design without being adjusted to a nicety, it lifted its load with apparently the greatest ease; in fact, Mr. Sopwith said it was difficult to keep the machine on the ground at all when the engine was turning at all fast. The speed appeared to be between 55 and 60 m.p.h., so, with full load and properly tuned, the machine should do well over 60 m.p.h. and still have power to spare. Some doubt was felt about the unsprung chassis, but Mr. Sopwith said, after making four or five landings, that it was the best sprung chassis he had ever used. Altogether it may be regarded as an unqualified success, and the Coventry Ordnance Co. are to be congratulated on the excellence of the first machine to bear their name.

On Monday, Mr. Sopwith took the machine out and did several straight flights with four people on board—two in the cockpit, and one sitting on the lower plane on each side of the fuselage. The biplane lifted them with the greatest ease. Afterwards Mr. Sopwith did several circuits with one passenger.

A New Departure in Aviation Insurance.

One of the troubles of aviators has hitherto been that they could not insure either themselves or their machines against accidents. Since Thursday last it has been possible to do so, for Messrs. Bray, Gibb and Co., Ltd., of 166, Piccadilly, write:—"*Re* damage to Aeroplanes by Pilots or Pupils. We beg to inform you that we are now in a position to quote for a policy against damage to the machines by pilots, or pupils during their period of tuition. We are also now in a position to quote for Life and Accident policies for pilots and pupils. As this marks a distinct advance in insurance hitherto available for aviation, we take the liberty of drawing your attention to the matter in the hope that it may be of interest to your readers." Mr. E. R. Adams, the manager for Messrs. Bray, Gibb and Co., Ltd., will be glad to send full particulars of the new policy to readers of The Aeroplane.

The Royal Aero Club.

At the Committee meeting on the 30th ult. the following new members were elected: R. A. Chalmers, Lieut. E. F. Chinnery, Walter Emden, Albert Hardt, M. R. N. Jennings, W. J. McCormack, Mrs. Samson, Capt. A. H. Williamson and Lieut. A. Wyness-Stuart.

The following Aviators' Certificates were granted: (208) L. A. Tremlett (Blériot monoplane, Hendon); (209) Lieut. J. D. Mackworth (Bristol biplane, Brooklands); (210) Lieut. E. F. Chinnery (Deperdussin monoplane, Brooklands); (211) John R. Duigan (Avro biplane, Brooklands); (212) Lieut. H. C. Fielding, R.F.A. (Bristol biplane, Brooklands); (213) Major Sir A. Bannerman, Bart., R.E. (Bristol biplane, Brooklands).

The request of the Aero Club of America for permission to issue an Aviator's Certificate to Mr. W. M. Stark and that of the Aero Club de France to issue a certificate to Mrs. W. Buller was granted.

The Aeronaut's Certificate was granted (16) the Hon. Mrs. Assheton Harbord. Mrs. Harbord is the first lady to obtain an Aeronaut's Certificate in this country.

A letter from Mr. H. Barber, kindly offering a trophy for general efficiency of British aeroplanes, was read, and it was unanimously resolved that the trophy be accepted, and a letter of thanks was ordered to be sent to Mr. H. Barber. The question of the regulations governing this trophy was referred to the Competitions Committee.

The Week's Work.

Monday, April 29th.

Brooklands.—At Deperdussin School, Naval Cadet Robinson (otherwise known as "The Gift") out rolling.

At Sopwith School, Mr. Raynham and Mr. Sopwith in turns on Howard Wright teaching Mr. Hedley and Capt. Howell.

At Vickers School, Colonel Hoskins doing good straights on No. 2 and Mr. Macdonald on No. 3.

The Plain (Bristol School).—In morning, M. Jullerot two trials, afterwards taking Mr. Pickles (new pupil) for tuition. Mr. Bendall with Mr. Lindsay Campbell (also new pupil). Good solos by Mr. Smith-Barry and Lieut. Wyness-Stuart on single-seater monoplane. Mr. Jenning out on tractor biplane, and Mr. Smith-Barry later on same. Fine cross-country flight by Lieut. Antonini with Lieut. Ercole on monoplane in direction of Shrewton, then round Salisbury, eventually gliding from fully 1,000 ft. to Bristol sheds. He has now finished at Bristol Schools, having gone right through without breaking as much as a wire, and has gone back to Italy, and will afterwards pilot a two-seater monoplane in Tripoli.

Tuesday, April 30th.

Brooklands.—At Deperdussin School, Naval Cadet Robinson doing straights for half hour. In afternoon Mr. Sabelli flying racer 20 mins.

At Sopwith School, Messrs. Raynham and Sopwith on Howard Wright teaching Mr. Hedley, Capt. Howell, and Capt. Alston.

Mr. Duigan on E.N.V.-Avro up 400 to 600 ft. for over an hour, doing circuits over Byfleet and Addlestone. Fine long flight for novice, especially as engine only rated at 35-h.p. Later doing straights with Mr. Garne as passenger.

At Vickers School, Colonel Hoskins put in 1½ hours' good practice on No. 2, and Mr. Knight also out on same machine.

At Bristol School Mr. Fleming up with Lieut. Sheppard.

Hendon.—At Grahame-White School, among new pupils who have joined school this week are Capt. Nicholas, of Indian Army, Commander Yeats-Brown, R.N., Mr. T. O'B. Hubbard, late of the Aeronautical Society, and several others. Morning rather gusty; wind dropped about 6 p.m., and school turned out. On biplane No. 3 Mr. R. H. Kershaw (new pupil) rolling, Mr. T. O'B. Hubbard doing straights and half circuits, Messrs. Morris and Roupelle doing straights and showing good progress, and Messrs. Biard and Manton circuits. On biplane No. 5 Mr. Lewis Turner circuits, prior to taking up passenger and afterwards going to assistance of Mrs. Stocks, whose engine in biplane No. 10 had stopped on far side of aerodrome. Capt. Nicholas out rolling on monoplane No. 4, and at second attempt made short straight flight.

At Blériot School Messrs. Aubert, Thomsen, Pothet, Teulade, and Clappen good morning's work. Three former circuits, others good straights.

The Plain (Bristol School).—Mr. Pixton first out, taking up Lieut. Dawes (new pupil), whilst Mr. Bendall flew with Mr. Campbell. M. Jullerot up in afternoon on two-seater monoplane, afterwards gave tuition to Lieuts. Wall, Dawes, Rinaldi, Campbell and Pickles, and then to Lieut. Fisher (prospective pupil). Mr. Pixton out on one of monoplanes with Capt. Grace and Lieut. Wall. Solos by Capt. Grace and Lieut. Hartraa on biplane No. 55, with good landings. Mr. Bendall took Lieut. Pickles and Mr. Campbell on biplane No. 55.

Waterloo (Liverpool).—In evening Mr. Hardman made several straights of half mile or more, and succeeded in making a circle, being in the air for 80 secs. Also made attempts at gliding quite successfully. Mr. Birch then took charge and made straight flight of 100 yards, as well as hopping shorter distances.

Windermere.—Lakes Flying Co.'s biplane out, fitted with new broad float. Flew easily at first attempt, did a circuit, and came in for some small adjustments. Then Mr. Gnosspelius took his machine out; did one straight flight. Landing rather heavily, damaged float, but was towed back and salved without wetting anything important (*i.e.*, the engine). Float will take some time to repair.

Wednesday, May 1st.

Brooklands.—Lieut. Parke, R.N., out for first time on new Avro monoplane, got off on half throttle very steeply, but landed all right, and then did straights.

At Deperdussin School, Naval Cadet Robinson doing straights for half hour and later for 15 mins. Mr. Sabelli up half an hour on racer.

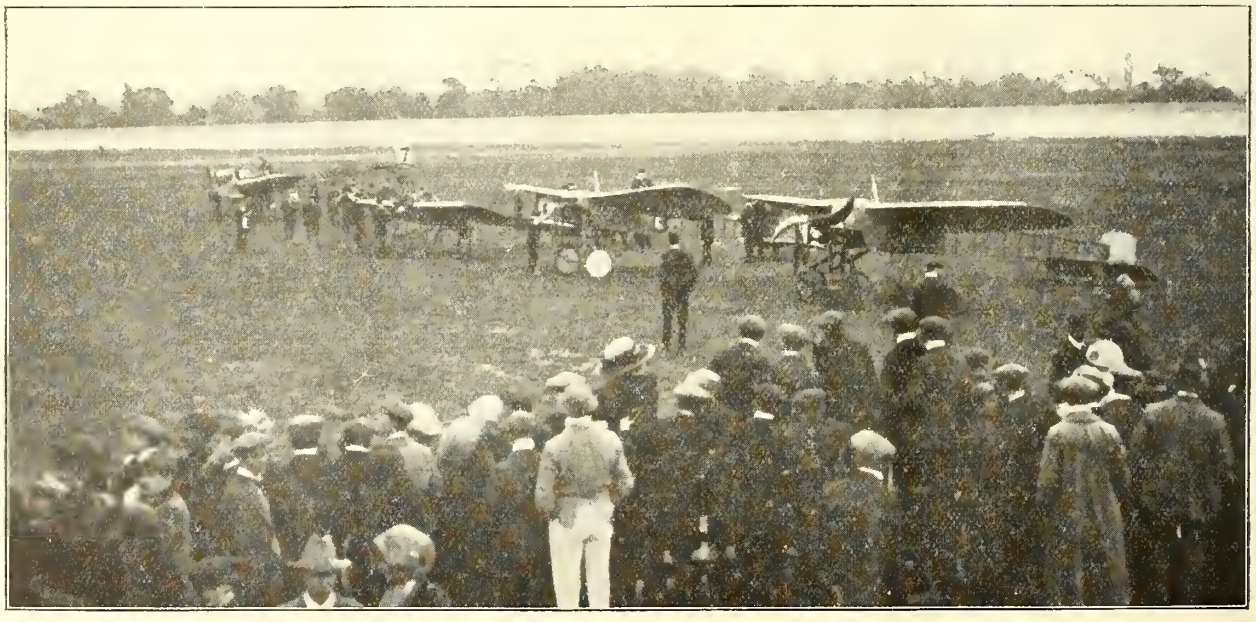
Mr. Partridge out for half hour on Hanriot, now fitted with 40-h.p. A.B.C. engine. Motor giving plenty of power and running without sign of misfire. Highly satisfactory test, showing engine better than foreign motors of higher rating.

At Vickers School, Captain Wood and Mr. Macdonald each doing test flights on No. 3.

At Bristol School Mr. Pizey out with Lieut. Sheppard. Then latter for first solo, doing good straights. Naval Cadet Wheeler making good flight; Mr. Pizey later giving first tuition to Mr. Desmond Arthur, who has now taken up flying, after being first passenger to go up in Ireland, with the late Mr. Cecil Grace in 1910. During afternoon Mr. Valentine on military two-seater arrived from Hendon.

Mr. Moorhouse flying splendidly on Radley and Moorhouse monoplane.

Hendon.—At Grahame-White School pupils all out early. On biplane No. 10 Messrs. Biard, Fowler, Hucks and Gates all



The start for the Cross-Country Race at Brooklands on Sunday. Left to right:—Mr. Kemp on the Flanders, Mr. Sabelli on the Deperdussin, Mr. Moorhouse on the R. and M., and Mr. Sopwith's Blériot. The two biplanes had already started.

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doing circuits. Mr. Biard, in addition, doing figures of eight and right-hand turns, quite ready for brevêt. On biplane No. 3 Messrs. Hubbard and Manton making circuits and Messrs. Morris and Kershaw doing good straights. Capt. Nicholas on monoplane No. 4 rolling, and later Mr. Lewis Turner made short flight on same machine. Mr. B. C. Hucks busy at circuits on monoplane No. 6, Mr. Morris rolling on biplane No. 3, and Mr. Lewis Turner at circuits on biplane No. 5.

At Blériot School Messrs. Thomsen and Aubert circuits, and ready for brevêt tests, together with M. Pothet.

The Plain (Bristol School).—After usual trial Lieut. Hartraa, observed by Lieuts. Connor and Reynolds, passed tests for certificate. Made very sharp figures of eight and finished trials by climbing to close upon 1,000 ft. and landing with clever glide. This pupil had only two solos at school before going for tests. M. Jullerot with Mr. Bendall on one of Bristol monoplanes for cross-country over Maddington, Shrewton and back to sheds. Lieut. Pickles and Mr. Campbell for tuition with Mr. Pixton on biplane No. 55, Mr. Bendall taking Lieuts. Dawes and Rinaldi. M. Jullerot with Mr. Kirby (prospective pupil). Lieut. Ercole for first straight lines on single-seater monoplane, whilst Lieut. Hall did complete circuit on similar machine at 100 ft., with good landing. Capt. Grace two good solos on biplane No. 55.

Waterloo (Liverpool).—Mr. Hardman started off with straight of about half mile, but engine not pulling its best, he got tail down at about 20 ft., and terminated in a *piqué* position, breaking propeller, one wing and several other sticks. Machine remained with tail erect with Mr. Hardman suspended by waist from seat in an Avro belt, probably saving personal injury.

Thursday, May 2nd.

Brooklands.—Lieut. Parke, R.N., on new Avro monoplane testing and doing straights for benefit of photographers.

At Deperdussin School, Naval Cadet Robinson straights at 15 ft. for half hour.

At Sopwith School, Messrs. Sopwith and Raynham on Howard Wright, and Burgess-Wright (now fitted with Green engine) flying. Latter flew perfectly at first attempt with little 35-h.p. engine, and handling excellently.

Mr. Duigan on 35 E.N.V.-Avro flying well.

At Flanders School, Mr. Fisher out for "solo joy-ride" experimenting in flying with one arm, other arm strapped to side to prevent sudden strain pulling it out.

At Vickers School, Mr. Macdonald testing No. 3, which now seems to be going strong.

Mr. Partridge on the old Hanriot with A.B.C. engine did three flights of 20 mins. each.

At Bristol School Mr. Pizey out with Mr. Desmond Arthur. Lieut. Sheppard good straights, and then flying circuits at 150 to 200 ft., making excellent progress. Later Mr. Pizey up with Messrs. Bulkeley, Sheppard, and Arthur in turn.

Mr. Moorhouse on Radley and Moorhouse monoplane flying well.

Dover.—Mr. Ewen flew from Boulogne to Dover Aerodrome on Caudron monoplane with 6-cylinder 45-h.p. Anzani engine. First time machine of this type seen at Dover. Too late to continue journey to Hendon.—(H.)

Hendon.—At Grahame-White School Mr. Lewis Turner opened full day's work with several circuits on biplane No. 5, afterwards taking up Commander Yeats-Brown in passenger seat for first lesson in controls. Mr. Grahame-White up in afternoon, making two passenger flights, followed by Mr. Lewis Turner with more passengers; and on same machine Mr. Hucks, whose engine stopped at 100 ft., and, being unable to restart it, pancaked down, smashing the machine pretty badly, but escaping unscathed himself. On biplane No. 10 Mr. Gates and Mr. Lewis Turner out doing circuits, and also Mr. Biard, who flew first half of brevêt tests; biplane No. 3 also out in hands of Mr. Gates, afterwards being taken over by Mr. Lewis Turner, who was in passenger seat teaching Commander Yeats-Brown rolling for over three-quarters of an hour.

At Blériot School, M. Aubert out early for a circuit.

The Plain (Bristol School).—No flying in morning, but towards evening M. Jullerot out with Mr. Campbell on one of Bristol monoplanes. Mr. Pixton taking Major Boyd Moss (new pupil), Lieut. Dawes and Mr. Pickles. M. Jullerot out testing new machine just received from works at Filton. Mr. Bendall also flying. M. Jullerot up on No. 55 with Major B. Moss. Lieut. Hall fine flight on Bristol single-seater monoplane. Lieut. Hall good solo on similar machine.

Windermere.—Biplane out again, made several successful flights.

Friday, May 3rd.

Brooklands.—Lieut. Parke, R.N., out early doing first circuits on new Avro monoplane for 10 mins. at 400 ft. to 500 ft. Climbs quickly, doing first 300 ft. in less than a circuit. Came down in involuntary glide owing to switch failing. In afternoon out for 15 mins., going up to 700 ft. and landing in fine glide.

In evening Mr. Percival on own biplane after various straight test flights, went for circuit and came down nose first in sewage farm, burying engine and smashing fuselage, but escaping absolutely unhurt, thanks to spring belt he always wears.

At Deperdussin School, Naval Cadet Robinson doing straights and curves for three-quarters of an hour. Mr. Petre flying 5 mins. and Mr. Sabelli 10 mins. In afternoon Mr. Robinson again out 10 mins. Messrs. Petre and Sabelli flying also. Notable feature of Deperdussin School is amount of work done by little Anzanis. Kept in fine tune by chief mechanic Trinaman. Lubrication pipes, etc., altered at school, and result self-evident.

Mr. Partridge out testing chassis of Hanriot and then did 50 min. non-stop flight. A fine performance for the little A.B.C. engine.

At Sopwith School, Mr. Raynham out on Howard Wright, and in evening on Burgess-Wright testing Green engine. Mr. Sopwith also on latter machine taking up Mr. Howard Wright.

Mr. Duigan on E.N.V.-Avro testing and tuning engine.

At Flanders School, Mr. Fisher up with Mr. Dukinfield-Jones in morning. In afternoon, Mr. Fisher again up experimenting with towing Marconi aerial.

At Spencer School, Mr. Spencer out tuning up for morrow's competition, flying well.

At Vickers School, Colonel Hoskins got in 1½ hours' good practice at straights on No. 2, and Mr. Knight also out.

At Bristol School Mr. Pizey, after test, took up Messrs. Bulkeley, Sheppard, and Arthur in turn. Mr. Sheppard then doing excellent eights and glides, and later a 15-min. solo and a glide from 150 ft. with good landing. In evening same pupils out, also Naval Cadet Wheeler and Lieut. Lewis, latter gliding from 200 ft.

Mr. Moorhouse on Radley and Moorhouse monoplane, doing usual fine performance.

Dover.—Mr. Ewen continued flight to Hendon about 6 a.m., after making circuit of a couple of miles or so, but brought down by wind at Canterbury. Pavilion shortly to be constructed at Dover Aerodrome, where there are already two wood and corrugated iron hangars constructed.—(H.)

Hendon.—At Grahame-White School Mr. Lewis Turner, Mr. Gates, and Commander Yeats-Brown at school at 4 a.m., and put in great deal of work. Mr. Gates doing circuits and right-hand turns. Mr. Lewis Turner, first in pilot's seat and afterwards in passenger seat, giving instruction to Commander Yeats-Brown in straight rolls. At 5 a.m. many more pupils turned up, and Messrs. Hubbard, Roupell, Kershaw, Commander Yeats-Brown, and Morris all busy at straight flights on biplane No. 3. Capt. Nicholas out rolling on monoplane No. 4, and after short adjournment for breakfast, school again returned to work: Commander Yeats-Brown starting off again with straight flights on biplane No. 3, followed by Messrs. Roupelle, Morris, and Major Liles; Capt. Nicholas and Mrs. Stocks on monoplane No. 4, putting in good practice at rolls and hops. Mr. Hucks on monoplane No. 6, flying several circuits and cross-country flights, all continuing work, with exception of a slight break for lunch, until dark.

At Blériot School seven pupils put in good day's work, Messrs. Aubert and Thomsen doing circuits, former going outside aerodrome out of sight and turning up very happy after first cross-country flight. Mr. Thomsen then up in same machine for circuit, and, turning abruptly, made unpremeditated *atterrisage*. Messrs. Welburn, Morris, Hall, Teulade and Clappen straights. Late in afternoon Mr. Crawshay, one-time pupil of school, took out latest pattern 50-h.p. Blériot, and starting from release gear, made beautiful flight over Elstree at about 2,000 ft., landing after 12 mins. with perfect *vol plané* and in such a position that he could almost have made another flight from same peg.

The Plain (Bristol School).—M. Jullerot with Major Boyd Moss first out. Mr. Pixton out with Mr. Campbell and Lieut. Pickles. Mr. Bendall with Lieut. Dawes, Major B. Moss with M. Jullerot. Good solo by Lieut. Ercole on Bristol monoplane. Lieut. Hall flying one of tractor biplanes. Mr. Jennings also out on this machine. Lieut. Wyness-Stuart first of all solo on tractor biplane and then out on monoplane, making good flights. Capt. Grace fine solo on biplane No. 55, flying at 800 ft. over Cavalry Barracks.

Windermere.—Biplane out with Mr. Adams as pilot and Mr. Wakefield as passenger; made two flights, each a couple of circuits; then with Mr. Gnosspelius for two circuits as passenger. Mr. Adams and Mr. Wakefield went for a trip to Bowness

and back, and finally one of the workmen was given a passenger flight. Machine carries passenger nicely, makes very little difference to its climbing capacities, and broad float works much better than old narrow one. These are presumably first hydro-aeroplane passenger flights made in England.

Saturday, May 4th.

Brooklands.—Lieut. Parke, R.N., out in very gusty wind after motor racing declared off. Horrible sight, as pitched about badly, but machine apparently under full control, having enormous warp.

Mr. Partridge on Hanriot intending to go to Hendon, did three test circuits, and coming down for petrol, caught in gust and came down on front of chassis, smashing a skid and wing tip.

At Sopwith School, Mr. Raynham out early on Burgess-Wright, and afternoon flying in bad wind. Machine seeming to answer quicker now rotary engine removed. Interesting to note that 35-h.p. Green turns standard Wright propellers at same number of revolutions as 50-h.p. rotary. 70-h.p. Blériot now fitted with new wings, with strengthened spars, extra ribs, and reinforced with internal wire bracing. Seems a very sound job.

At Flanders School, Mr. Fisher out with Lieut. Babington, R.N. (new pupil) doing circuits in good style. Several military pupils shortly to join school.

At Bristol School Lieuts. Sheppard and Lewis making good flights in morning. In afternoon wind and rain bad, but Mr. Pizey up for a couple of hazardous flights.

Mr. Moorhouse also out for a very bad shaking, but making a splendid landing.

Hendon.—First May Meeting postponed owing to wet and wind. Many people arrived at gates, but were turned away, as Mr. Gates refused to take money when flying so unlikely. Far the best course, and will give better impression than admitting spectators in impossible weather.

Sunday, May 5th.

Brooklands.—At Bristol School, in early morning Mr. Pizey out with pupils, Lieut. Sheppard went for certificate, flying well, but in landing touched right wing-tip and broke spar and aileron.

During afternoon very fine flying. Get-off competition won by Mrs. Hewlett on Blondeau-Hewlett biplane, with 3 secs. The first time an aviatress has won an open competition. Mr. Sabelli on Deperdussin second. Later excellent flying on Mr. Sopwith's Green-engined Wright by Mr. Raynham, Mr. Spencer on own biplane, and Mr. Sabelli on "Dep.," and some pretty work by Mr. Moorhouse on R. and M. monoplane. Later a cross-country race to Chertsey and back for the Second Malcolm Cup, won by Mr. Sopwith on his 70-h.p. Blériot by seconds from Mr. Pizey on the Bristol. Mr. Moorhouse a good 3rd, and Mr. Raynham, on Green-engined Wright, 4th, and Mr. Sabelli on the little Deperdussin 5th, owing to mistaking turning point. Mr. Kemp on Flanders also started, but put back for adjustments.

Later more flying by Mr. Pizey, Mr. Hotchkiss and Bristol pupils. Mr. Hotchkiss first aviator of 1912 to fly in flannels. Lieut. Hewlett, R.N., and Mr. Abbott flying well on Blondeau-Hewlett biplane, Mr. Fisher on the Flanders and Mr. Petre on the "Dep."

Then came the important event of the day, the first appearance of the magnificent Coventry Ordnance Biplane. After some preliminary running of engine, machine started to roll, with Mr. Sopwith as pilot and Mr. Manning as passenger. Promptly got off ground in about 30 or 40 yards at about 20 miles an hour. Mr. Sopwith brought her down and rolled the length of ground, actually hopping most of it. Turned facing wind, and came back about 20 ft. up, apparently flying perfectly. Flew twice more length of ground and then taken in owing to darkness, but beaming smiles of Messrs. Howard Wright and Manning at absolute success of new machine almost enough to allow photographs to be taken. Congratulations showered on happy constructor and designer by everyone.

Hendon.—Mr. Grahame-White doing very fine exhibition flights on Nieuport. Mr. Turner carrying passengers on Howard Wright biplane formerly belonging to Mr. Robert Loraine. Mr. Grahame-White also out on a new "Baby" biplane. Mr. Hucks flying old Gordon-Bennett Blériot in good style, and did not have "narrow escape from a terrible death" reported in some papers, through engine stopping. Did several good glides on purpose. Alarming reports presumably rose from biplane pancake on Thursday.

Mr. Bell in Turkey.

Writing from Péra on April 28th, Mr. Gordon Bell says: "After much trouble managed to get my 'bus through. Accomplished the first flight in Turkey and over Constantinople on Friday. The *remous* over the town are fearful; even at 5,000 ft. you get an awful shaking.

"Yesterday I flew over the review before the Sultan and the Minister of War; great enthusiasm. The 'bus is, of course, a R.E.P., with a 70-h.p. engine, and flies remarkably well and climbs about 250 ft. a minute.

"Hope to see you next week. Shall be jolly glad to get back to England. Hope the paper still flourishes.

The Naval Aeroplanes at Weymouth.

Two Short biplanes, a Short monoplane, a Deperdussin monoplane, and a Nieuport monoplane are temporarily in camp at Lodmore in preparation for the Royal Review. On Sunday Commander Samson, R.N., and Lieut. Gregory, R.N., both made flights across the bay on the biplanes. Later in the afternoon the former officer took Miss Callaghan, the daughter of the Admiral commanding the combined fleets, for a flight of six miles. As an example of an aviator's daring a daily paper of some standing states that Commander Samson executed "a *vol plané* from a great height, yet he landed so gently that the machine only ran a few yards after touching earth." According to the same paper, he showed great resourcefulness because when "the machine (the monoplane this time) tilted to port, owing to the inequalities of the ground," he "put all his weight to starboard and prevented the wing from being injured."

The 100-h.p. Short tractor hydro-aeroplane is stationed about five miles from the above aviation camp. It was flown several times on Saturday by Lieut. Longmore, R.N. The float at present fitted is apparently of low efficiency, judging by the amount of disturbance caused in the water before the machine begins to rise.

H.M.S. Hibernia has been fitted with a scaffolding arrangement extending from the top of the forward turret to the bow. This erection, from which an aeroplane is to be launched, is in the form of two parallel troughs in which the wheels run, and effectually puts the two 12-in. guns in the forward barbette out of action, and the arc of fire of the two forward 9.2 guns is also reduced by half. It is hardly a practical fitting for war purposes, and is not supposed to be so, being purely for demonstration purposes, though doubtless it will be regarded as a serious effort by some of the less informed members of the Service, and will create a corresponding prejudice against aeroplanes for naval work.

On Monday last slight mishaps occurred to Commander Samson and Lieut. Spencer Grey, but neither was injured at all.

The Aeronautical Society.

A Special General Meeting of the Society will be held on May 16th, at 8 p.m., at the Royal United Services Institution, Whitehall, for the purpose of amending Rule 27 in respect to Associate Members, in such form as shall make the subscription to that grade one guinea per annum and the entrance fee nil. The programme of Meetings to be held at the Royal United Services Institution are:—May 16th, Thursday, 8.30 p.m., Mr. F. H. Bramwell on "National Physical Laboratory Research"; June 12th, Wednesday, 8.30 p.m., Mr. G. Holt Thomas on "Hydro-Aeroplanes."

The next informal meeting will be held at 11, Adam Street, Adelphi, on Monday, May 13th, "Double-Engined Aeroplanes," at 5 p.m.

An Aviatic Wedding.

Congratulations to Mr. Stuart A. Hirst, chairman of the Yorkshire Aero Club, who was married on April 30th to Miss Marguerita Blackburn, of Apperley Bridge. The happy pair are spending their honeymoon on the Riviera and Italy. Mr. Hirst has done much for the good of aviation in Yorkshire, and it is to be hoped that on his return from his honeymoon he will set to work to stir up an interest in aviation in the north of England. Everyone concerned with the sport will wish the newly wedded pair every happiness.

A Welcome Return.

His many friends have recently had the pleasure of welcoming back to England Mr. J. Herbert-Spottiswoode, who a couple of years ago gave promise of becoming a really good flier on the old Avis at Brooklands. Other calls on his time prevented him from continuing to fly, but when anything big is going on Mr. Spottiswoode has always been a most willing worker. He talks of going to Canada, but it is to be hoped that he will still be over here during the War Office Competition, for there will then be plenty of demand for his help.

A Noteworthy Engine.

In these days of eleven-hour non-stop flights, runs of half an hour or so may seem small, but it must be remembered

that the long flights are only done after many attempts and much tuning. When, however, a comparatively unknown engine does something good, that engine is worth watching. It will be recollected that Mr. Charteris, of the A.B.C. engines, recently fitted one of his 40 h.p. engines into the ancient Hanriot belonging to Mr. George England. This machine formerly had a 50 h.p. French engine of high reputation, but never flew for any length of time. The little A.B.C., which is of the new type with steel cylinders, having done a full-power non-stop bench test of 6 hours, started off on Tuesday of last week by making a non-stop flight of half an hour with Mr. Partridge as pilot. On Thursday, the machine needing adjustment, he made three flights of 20 mins. each, and on Friday evening he did a 50 minute non-stop flight, showing that the engine is now good enough for a long-distance cross-country flight. Not only is the machine now doing longer flights than she ever did with the French engine, but she is fully five miles an hour faster. A distinct credit to British design and workmanship.

The Latest Green Engine.

Considerable interest is likely to be aroused by the appearance at an early date of the new All-British 100 h.p. 6-cylinder Green engine, which contains a number of refinements and improvements suggested by the experience of the last twelve months. Full particulars will be published at an early date.

Weston, Hurlin and Co.'s Works.

Messrs. Weston, Hurlin and Co., who have already made a big reputation for themselves as model builders, are now busy on full-size work. They have received several orders from various countries for military-type machines, including hydro-aeroplanes. They are also building a hydro-monoplane, designed to be quickly taken to pieces. This machine is ordered for Holland, and contains some sensible ideas in the way of strengthening. Many of these ideas are quite original and are patented or of registered design.

Mr. Hurlin has taken the keenest interest in aviation for a number of years, and the firm have in their employ a particularly smart designer, so that experimenters would do well to communicate with them before starting to construct on their own account.

Cheltenham and Aviation.

Mr. Harry Higgins, who for a couple of years has pluckily endeavoured to stir up interest in aviation in this district, has been obliged to give up taking an active part in aviation. There is so little encouragement given in this district that he finds it impossible to keep going. He was doing very well, for he managed to get his machine off the ground on Easter Sunday, but owing to being warned off the only decent bit of ground there—"The Racecourse"—by the so-called sportsmen who hold it, he does not think it worth while going on. It may be remembered that the same people would not let Mr. Hucks use the ground.

They told Mr. Higgins not to go there, but he had made up his mind to go, so he went while the keeper was asleep, the point being that the inside of the course does not belong to the Race Committee; also there is a right of way across the course itself, so that if anyone wanted to go there he could carry his machine over, and run it up and down the footpath. Mr. Higgins is of the opinion that anyone flying near Cheltenham ought to land inside the racecourse, as, legally, he does not think they could be prohibited by the Race Committee. The Polo people who rent the inside of the course, and also the farmer who lets part of it, are good sportsmen. Mr. Higgins hopes this information may be of interest, as the course will have to be used by cross-country pilots at some future date.

His little experimental machine would make quite a nice little set, as it is in perfect condition, and he would sell the lot cheap. It is exceptionally light and strong, the wheels are 20 in. Dunlop tyres, propellers of laminated mahogany and Kauri pine, 7 ft. 3½ in., pitch 6 ft. 3 in., ash axle, forged steel ends, rubber springs, so that it rides over anything. When the engine is out it would make a good glider, as it is only about 100 lbs. weight with 244 sq. ft. surface.

Aviation in Scotland.

Scotland, foremost in science and engineering, is strangely behind in aviation, despite the fact that the Lanark Meeting was the most successful held in this country. There is some hope of a revival this year, as Mr. G. S. Wilson, of the *Edinburgh Evening News*, is very patriotically taking a Caudron biplane to Mr. Ewen's former ground at Lanark, and hopes to stir up some enthusiasm with it there. It is to be hoped that some of the Edinburgh sportsmen who cannot afford machines of their own will at any rate take a personal interest in it, especially as they are not asked to take a financial interest. When the Royal Flying Corps really gets to work, Lanark is likely to become an aerodrome of first-class importance, being in the centre of the Scottish Command, and also on the course which military aviators will follow in the course of their training.

On the West Coast the fire at the Barrhead Aerodrome has set things back badly, and Mr. W. G. Duncan writes that he himself is sailing for Australia in August, though he hopes the Scottish Aviation Company will be continued by Mr. Norman as soon as insurance matters have been settled.

The once promising Scottish Aeronautical Society seems to have fallen on evil days. At the Annual General Meeting on April 30th only nine members attended, eight of them being committee men, which seems to show either that the ordinary members are singularly apathetic or that the Society has not been properly conducted so as to make it popular. Of the nine present three resigned, which looks still less encouraging. Possibly one reason for the decadence of the Society is that one hears so little about it. The Aeroplane, at any rate, does not appear to have had a single report of anything the Society has done.

The Month's Work at the Bristol Schools.

Exceedingly useful work has been done during April at the Bristol Schools. Ten pupils won Royal Aero Club certificates, and all ten were officers in His Majesty's Services. Their average time for tuition worked out at just over three weeks. Their names are: Sir Alexander Bannerman, Commandant Air Battalion; Commander Schwann, R.N.; Captain Fielding, Indian Army; Captain Broke Smith, R.E.; Lieut. Freeman, R.N.; Lieut. Ashton, 4th D.G.; Lieut. Hartraa, R.A.; Lieut. Rogers Harrison, Royal Warwickshire Regiment; Lieut. Edmunds, R.N.; Lieut. Mackworth, Indian Army.

At the present time there are altogether 81 Naval and Military aviators qualified for the Central Flying School, as a step towards the Royal Flying Corps, and out of this number 50 have been trained at the Bristol Schools. Added to this there are 20 Service officers still under tuition at the schools, and many more have signified their intention of joining.

From statistics compiled during the month of April 579 flights have been made at the Bristol Schools, giving an aggregate of 3,590 miles flown without any injury to pupils or pilots, a record of which the Bristol people may well be proud.

Some of the latest types of Bristol machines have just been added to the schools, which, with the excellent staff of instructors and admirable flying grounds, can only be productive of the best results.

The Planes, Ltd., Monoplane.

The Planes, Ltd., monoplane, to which reference was made recently, has been doing well lately. Mr. G. T. Swaby wrote on April 29th:—"We have fitted the new ball-race to the big-end (of the Isaacson) and as far as we can judge the engine is now O.K., gives ample power, and shows no signs of giving out. Fenwick gave her a short run over to Melly's the other morning, later on taking me for a spin of about twenty miles, and as I weigh nearly twelve stone it was a fairly good test. She took us both up with the greatest ease, and was as steady as a church, although a fairly stiff wind was blowing. We were both as pleased as Punch with the performance. The engine in front gives one every confidence in case of a smash, while the propeller behind spares one the terrific blast of the slip-stream and allows a very clear view ahead, the body is as comfortable and warm as a motor car, and the controls working in the direct slip-stream are as powerful and quick as the most exacting pilot could demand.

"The surface is only 200 ft. all told, so there must be efficiency somewhere! The landing chassis seems quite unbreakable, judging by the bumps it has stood for the last three months. Fenwick is quite confident that she can carry three passengers as easily as two (she carries two as easily as one, to all seeming), though it would be rather hard to stow the third away as the whole machine is so small."

Technical Instruction in Dublin.

Mr. R. W. Taylor's engagement for this session at the Technical Institute, Dublin, closes at the end of May. The students have had lectures and constructional classes in practical work, comprising strut-making, spar-making, standardising, template-making, fuselage design and construction, built-up propeller-making, varnishing, French polishing, wire-bracing, pattern making, etc. In the model-making section a number of types have been made and successfully flown in the Phœnix Park on Saturday afternoons.

MISCELLANEOUS ADVERTISEMENTS

All Advertisements for this column should arrive at this office by 6 p.m. MONDAY, to ensure insertion.

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1. CROSS-COUNTRY TEAM HANDICAP.
2. GRAND SPEED HANDICAP.
3. ALTITUDE CONTEST.

NEXT WEEK. SAT., MAY 18th, At 3.30 p.m.
(Entries close May 14th).
SUMMER MEETING.
1. CROSS-COUNTRY HANDICAP.
2. GRAND SPEED HANDICAP.
3. ALTITUDE CONTEST.

FORTHCOMING EVENTS.
Saturday, May 25th, Second London Aviation Meeting.
Sunday, May 26th, Special Exhibition Flights.
Whit Monday, May 27th (12 noon), Second London Aviation Meeting (Second Day).
Saturday, June 1st, June Meeting.
Saturday, June 8th, First Aerial Derby ("Daily Mail" Trophy).
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Edited by CHAS. G. GREY. ("Aero-Amateur")

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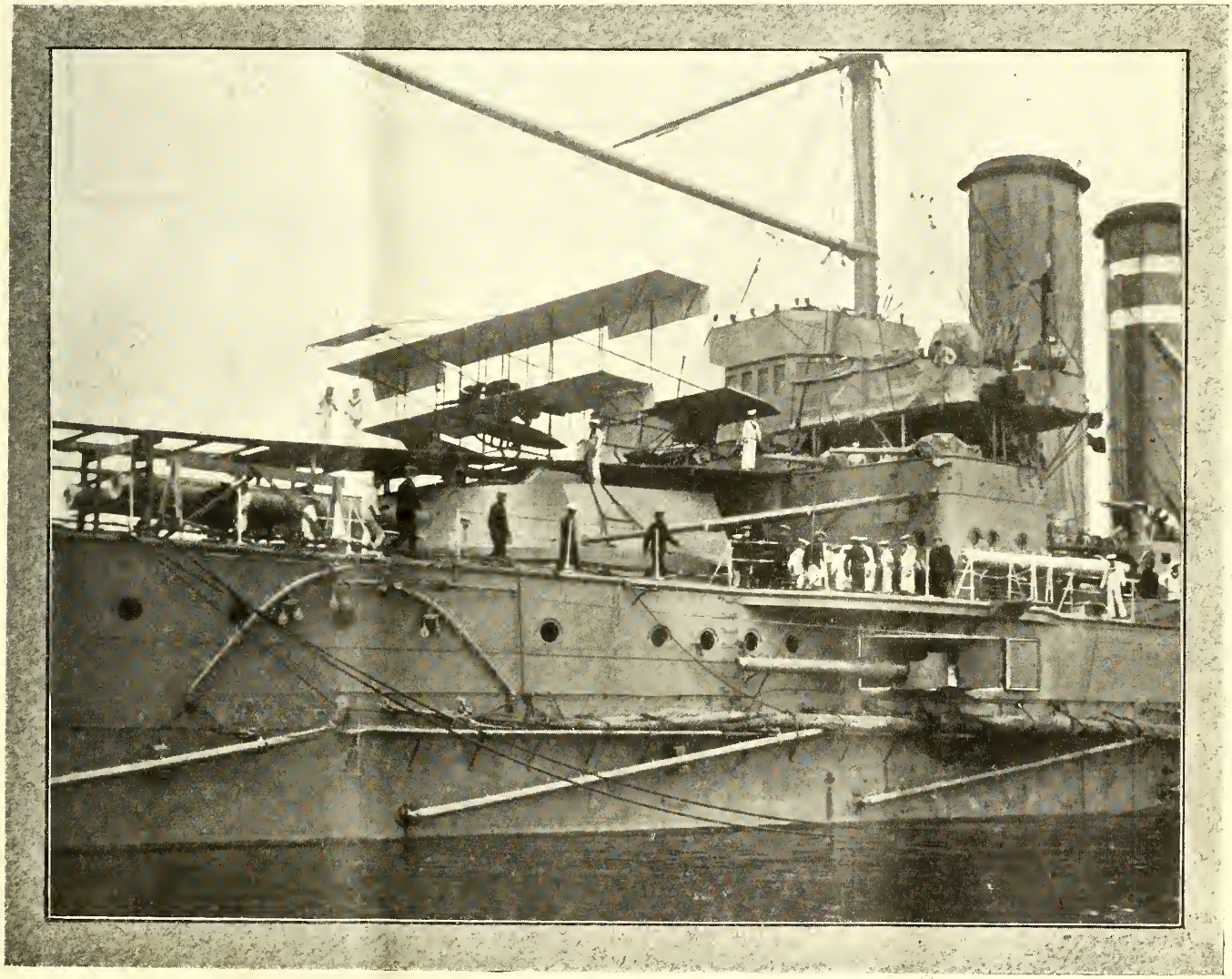

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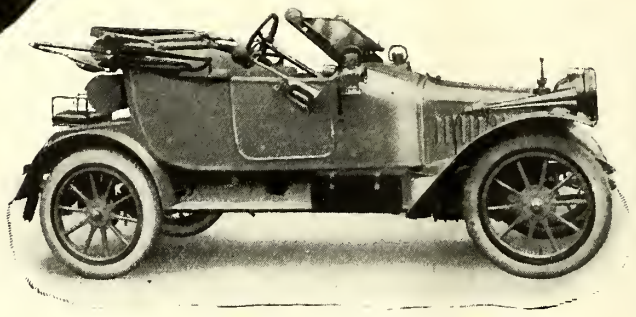

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MATTERS OF MOMENT.

THE NAVAL REVIEW, THE AVIATORS AND THE PRESS.

Very justly, and long after it was their due, the four naval aviators who have been working so hard at Eastchurch for the past twelve months and more, have, in the American phrase, "collected some of the limelight," and the aeroplane has been officially recognised as a part of our naval equipment. It is only to be hoped that the booming which the daily papers have given to the performance will cause a permanent increase in the interest the general public take in aviation.

The annoying part of it is, however, that the flights they have made at Weymouth, flights which have aroused all the verbal post-impressionists of the daily Press to a delirium of enthusiasm, are intrinsically worth considerably less than the work they have been doing every possible day at Eastchurch for months past.

When the then Lieutenant Gerrard, R.M.L.I., with Lieutenant Lushington, R.M.L.I., as passenger, broke the world's record for duration with a passenger on a biplane, our intelligent Press disposed of the matter in about three lines, but when Captain Gerrard does a little trip round the royal yacht on a fast monoplane, the daily Press enthuses to the extent of whole paragraphs.

When Lieut. Samson, as he then was, performed the very risky feat of getting a box-kite off a ship for the first time, it is true that most papers made some slight comment on the feat, but when he takes a fine, high-powered tractor biplane, fitted with properly tested floats, off nice, calm water, and proceeds to fly round the fleet a few times, the daily Press becomes absolutely lyric. Probably the high-water mark, or the lower-water mark, according to one's point of view, is reached by a certain paper which says :—

"Commander Samson is the hero of Weymouth. His pointed beard and lustrous magnetic grey-blue eyes under heavy eyelids are strongly reminiscent of Captain Kettle.

"He dashes about in his motor-car between Portland and Lodmoor with Mr. Short and the three other naval airmen, and is often cheered as he passes through Weymouth."

The same paper says :—

"I have positive knowledge that emissaries from at least two other naval Powers are here straining every effort to obtain plans and photographs of the details of S41, and a number of detectives are also here to assist the naval authorities in preventing them. Britain's triumph with S41 has stunned the Admiralties of Europe, including our own."

And then the same paper publishes as many photographs as possible of the machine. True, they are scarcely of such quality as to be of much value to foreign designers, but that is more luck than judgment. Our good friend Mr. Horace Short must feel hugely amused at the idea of his big 100-h.p. experimental tractor biplane "staggering humanity" in this way. What will happen when Mr. Short has finished his experiments and produces a machine which he declares to be his ultimate effort?

The Aeroplane ventures to extend to the naval aviators its sincere sympathy on the fact that, while their real labours have passed unnoticed by the Press and the public, performances which are, after all, mere play to them, should be blazoned forth in a way which would, but for their solid worth, merely cover them with ridicule.

The comments of the daily Press on the whole performance are quite on a par with its intelligence whenever anything new is produced, and really force one to believe that the chief qualification for employment on the average daily paper is an absolute ignorance of ordinary subjects which are quite familiar to every board-school boy, and are even within the ken of the average youth trained at a big public school, where, of course, general knowledge, naturally, cannot be allowed to interfere with cricket and football, and where, in consequence, no great amount of general knowledge is expected. It was the same when the bicycle was first introduced, and it was the same when the motor car came into being, but it is really rather astonishing how the average newspaper maintains such a steady level of ignorance throughout its staff.

However, one paper at least has been advanced enough to instruct the British nation definitely as to the future development of naval aeroplanes, and for fear that some of the readers of The Aeroplane may not have seen this splendid effort, it is well worth quoting. It is true that some of the statements are somewhat hazy, but it is quite encouraging to find a halfpenny paper making them to its readers at all, especially as it is certainly not more than six months since the present writer endeavoured to convey the facts in this paper and in the *Evening Standard*, and not more than six weeks since he dealt with the same points somewhat more explicitly in the *English Review*.

Thus the paper in question :—

"I have been privileged to learn a great deal of what is going on that is not public knowledge, and I am able to say with absolute assurance that within two years every British warship larger than a destroyer will carry one or more aeroplanes."

"It will be possible for these aeroplanes to be launched from the deck without any run at all and to float even in a rough sea till taken on board.

"They will be fitted with wireless telegraphy apparatus, controlled by a passenger wearing a sound-proof helmet and provided with bombs and a rifle.

"They will command from even only 1,000 ft. altitude an area of fifty miles square.

"They will be capable of alighting on land as easily as on the water.

"It is not intended that they should alight on the deck of a ship."

The first paragraph is quite as it should be.

As to the second, it would certainly be interesting

to know how the aeroplanes propose to leave the deck without any run at all. Evidently the operation of the launching gear has been forgotten.

The third is too precious to pass without comment. There is a story to the effect that a Western American who came to London, met up with our telephone system for the first time, and having endeavoured for half an hour to obtain the number he required, he drew his six-shooter and blew the instrument to pieces. One can only surmise that some similar idea is at the back of providing bombs and a rifle as well as a sound-proof helmet to the "wireless" operator.

In the next paragraph it may be interesting to note that an area of 50 miles square contains 2,500 square miles, and that the aviator in the middle would have to see a matter of 36 miles in order to see to the corners of the said square, so that he would not only need excellent vision, but exceedingly clear weather in which to exercise it.

As regards the next point, it is quite possible that when used for coast-defence work hydro-aeroplanes may be made capable of alighting on land, but it is practically certain that those usually carried on board ship will not have any landing gear suitable for solid ground, and for deep-sea work, hydro-aeroplanes will probably not be used at all, only small, high-speed monoplanes being carried.

As to the last paragraph, it may interest this extremely knowledgeable journalist to know that so far as the Navy is concerned, it is distinctly intended that every effort shall be made to evolve an aeroplane which will alight on the deck of a ship, or, at any rate, one which can do so with only a certain amount of damage, should circumstances demand it.

Finally we get this :—

"Here are a few facts about S41 which are incontestable :—

"No battleship in Weymouth Bay could hit her at 2,000 ft. altitude.

"She could drop 300 lb. of high explosive upon the biggest ship here and utterly destroy it.

"Commander Samson, by his wonderful achievements with her, has raised himself at a bound to a level with Blériot and Lieutenant Conneau in the roll of famous airmen.

"S41 is the pioneer of Britain's aerial navy."

Only one epithet applies in this case, namely, the useful if impolite word "Bunkum." As a matter of fact, at 2,000 ft. an aeroplane would not be safe from rifle fire, let alone high-explosive shells from quick-firers. A 300 lb. bomb dropped from an aeroplane, supposing it had the luck to hit a battleship, would not penetrate the deck armour, and would simply explode upwards, with the possible result of killing a few men in the neighbourhood, and it would not have anything like the accuracy or destructive power of a shell from one of the new 13.5-in. guns. Commander Samson would be the last man in the world to claim equality with Blériot as an inventor and designer, or with Lieut. de Conneau as a cross-country flier, and would claim no superiority over Lieuts. Gregory and Longmore, R.N., and Captain Gerrard, R.M.L.I., his equally able brother officers. And, finally, S.41 is a splendidly built and very interesting experimental machine. The real pioneers of "Britain's Aerial Navy" are Mr. McClean's two dear old Short box-kites, on which Mr. G. B. Cockburn taught the practice of flying to the four officers who are for the moment the heroes of the daily Press. Also, let us remember that the pioneers of hydro-aeroplane work in this country are Mr. Gnosspelius, Mr. E. W. Wakefield, Mr. Stanley Adams, and Mr. Kemp, with the monoplane and biplane, on Windermere, and Commander Schwann and Mr. Sippe at Barrow.

Do let us recognise the facts, and behave like sane beings instead of like hysterical children.

An Insult to British Aviation.

But for the fact that British aviators and British constructors are now pretty well independent of the caprices of the daily Press, the latest incursion into aviation on the part of the *Daily Mail* would be a particularly severe blow to British aviation. The *Mail* has undoubtedly, according to its lights, done quite a good deal to assist in popularising aviation in this country, but for some strange reason it has only once seen fit to make any special effort for the benefit of British aviators or constructors. It is, however, somewhat peculiar that at the present stage of development those who are responsible for the paper should see fit to engage a French aviator on a French machine to tour England and Wales, ostensibly for the purpose of interesting the public in aviation.

There are certainly few better fliers than M. Henri Salmet, and it is very doubtful if there are any machines better than the Blériot, and there are very few as good. Consequently, so far as the aviator personally and the machine as an example of aeroplane design and construction are concerned, the *Mail* could certainly not have found better examples. Nevertheless, one would have thought that, as it is definitely stated that the scheme has been evolved "in order to hasten the development of flying both by land and by sea, in which we are still far behind our foreign rivals," it would have been advisable to have engaged a British aviator on a British machine. There are in this country several aviators quite as capable as M. Salmet, and there are machines which fly as well as the Blériot, so that it would have been quite possible to have advertised aviation—and, incidentally, the *Daily Mail*—throughout the country, while at the same time supporting British industry.

The *Daily Mail* is very fond of impressing on its readers its own generosity in spending £30,000 "in the encouragement of aeronautics," but, unfortunately, the writer cannot remember that any of this vast sum has gone into the hands of British aviators, except a matter of £1,000 won by Mr. Moore-Brabazon for an all-British circular mile in 1909, though it would have been quite easy with the remaining £29,000 to have worked quite as much advertisement for the *Daily Mail*, while giving considerably more encouragement to British aviation.

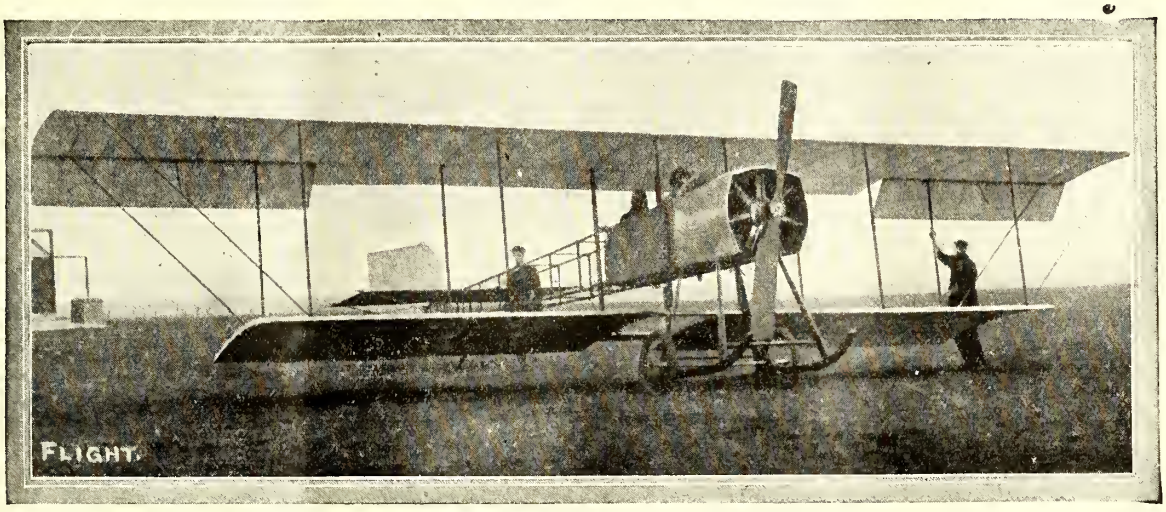
Peculiarly enough, in its announcement on Monday last, the *Mail* heads its announcement, "*Daily Mail* Aeroplanes and Waterplanes," without indicating in any way what is to be done in the waterplane department.

So far as British aviation is concerned, this scheme is likely to do more harm than good, because, if any provincial sportsmen are suddenly infected with flying fever by M. Salmet's visit, they will naturally at the same time imbibe the pernicious idea, only too common in official circles, that British aviators and machines are inferior to those produced abroad, and, consequently, the effect will be similar to that produced by the other *Daily Mail* competitions, that more and more money will go abroad. However, having registered this protest against the unpatriotic action of one of our greatest British capitalists, The Aeroplane wishes M. Salmet, and the Blériot firm as such, every success during the projected tour.

The published opinions on the scheme are rather entertaining. Colonel Seely, who, it may be remembered, has a touching faith in non-British machines, is alleged to have said that he is "in favour of any scheme which has so patriotic an object as the one put forward." Mr. Alan Burgoyne, M.P., whose speciality is naval matters, and who had once something to do with offering a prize for a flight across the heart of London, said "this latest venture is the most patriotic they have undertaken." Lord Charles Beresford, whose knowledge of aeroplanes is perhaps not so great as his acquaintance with the tribulations of the lower deck ratings, said "the suggestion is excellent." And Mr. Roger Wallace, ex-chairman of the Royal Aero Club, apparently took some trouble to be beautifully non-committal. What quaint ideas of patriotism are possessed by some people.

If the *Daily Mail* intends to do anything with hydro-aeroplanes—or "water-planes," as it is pleased to call them—perhaps it will see the error of its ways and arrange that its water programme shall include an all-British hydro-aeroplane, piloted by a British aviator, to fly round the coast of Britain.

CONTRACTORS TO THE ADMIRALTY.



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PASSENGER FLIGHTS IN MONOPLANE OR BIPLANE.

Observation.

BY W. E. de B. WHITTAKER.

The art of war in general has altered but little in the course of the centuries. Each new discovery in military science has merely extended the field of battle. The underlying principles are to-day essentially the same as they were in the days of Hannibal. Brute force ignorantly and extensively employed has always fallen before scientific dispositions, provided the numerical difference in the opposing armies was not too great. Warfare and the game of chess have, and have ever had, much in common. In both, it is the skilful playing of brain against brain, with the additional complication of the human factor in the former. They are both games, in the one case with men's lives, in the other with inanimate pieces of wood or ivory. In both, it is the art of divining and counteracting the next move of your adversary that counts for most, and in both it is the combatant who makes least mistakes who ultimately attains success.

There is one important difference. In chess the dispositions of both forces are clearly displayed to both sides. In war it is rarely the case that one knows clearly the position and formation of one's enemy. It is, therefore, of paramount importance to discover, so far as one may, the enemy's extent and movements. And this is where reconnaissance enters. Time after time in military history great armies have been defeated owing to incomplete and careless reconnaissance. Had Sir Redvers Buller taken the precautions in which he had had so many lessons in the earlier part of his life, Colenso would not be so dark a page in England's history. That a man whose fame rested on his leadership of irregular troops in warfare of which scouting formed so large a part, should act without the slightest information of value and use his entire army in a frontal attack to display his enemy's strength, is quite inexplicable.

The Value of Reconnaissance.

Accurate reconnaissance has wider reaching effects than at first appears. For instance, if a general can obtain good information as to his enemy's movements in good time, he can save his troops a great deal of unnecessary work. Many contests have been lost through the over-tiring of an army by unnecessary and extended marching from point to point owing to lack of knowledge of the enemy's position.

In no manner can information be gained so accurately and so rapidly as by the employment of swift aeroplanes. The field of battle then, indeed, becomes a chess-board, with all revealed save the future.

At the present stage of aeronautical science, when we are still endeavouring to produce the ideal type of aeroplane, it is natural that the question of observation should weigh greatly in the minds of designers. As our knowledge increases there should be no difficulty in producing an aeroplane of the highest efficiency which, at the same time, gives a perfectly clear view of the ground below. But on no account should efficiency be sacrificed that observation may be improved, for it is obvious that incomplete information is better than no information at all. The inefficient aeroplane would soon be out of action. The question of the moment is whether it is necessary to carry a trained observer in addition to the pilot.

Brigadier-General Henderson, in his recent lecture, divided certain qualities in aeroplanes into two classes—the essential and the non-essential. The carrying of an observer he put in the latter class, and later claimed that the consensus of French military opinion agreed with him.

Pilot-Observers or Observers and Pilots.

For extended strategical reconnaissance it is probably correct to say that single-seaters piloted by officers trained in observation would be sufficient, as it is merely necessary to fix the position of large bodies of the enemy. But for tactical reconnaissance, when the closest detail is desired, I do not see how it can be done without the aid of a trained observer as passenger. To make accurate observations great mental concentration is required, and it can hardly be argued that under present conditions a pilot could control his aeroplane in a troublesome wind and at the same time give his undivided attention to placing the positions of the troops below him and determining exactly what they were doing.

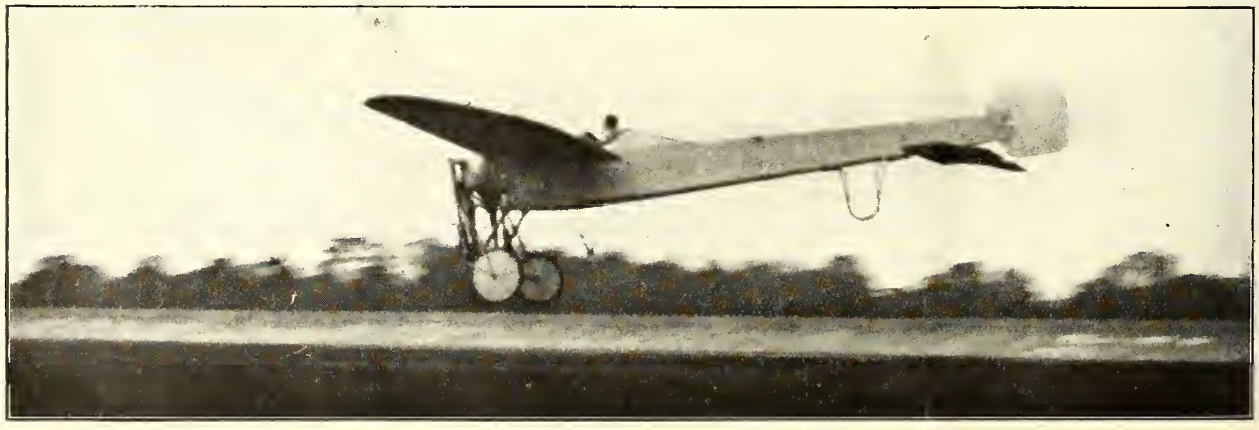
Again, as it is unlikely that an enemy of common intelligence would passively allow extensive observations, it is probable that the observer-pilot would have also to be on the look out for opposition aeroplanes. If men could be relied on to act with the precision and unvarying placidity of an automaton perhaps a pilot could do all these things, but the human factor cannot be forgotten. Besides this, though the pilot-observer must make observations, the opposing aeroplanes have simply one object—to prevent his safe return.

Captain Pichot-Duclos (French Army General Staff, 20th Corps) has recently published a book on "Reconnaissances en aeroplane," in which he places on record his own experiences and those of others as observers on aeroplanes during the past few years. In the course of the 1911 manœuvres he made many flights as observer on aeroplanes piloted by Captain Etévé and by Eugène Renaux. After a prolonged reconnaissance with the former he says: "I did not lose a single moment in the course of this reconnaissance; I constantly noted and sketched what I saw; the movement by me of a control lever, even a simple movement, would have disturbed me and interrupted my observation."

Foreign Views.

The German Imperial General Staff consider it essential that a trained observer shall be carried.

The Austrian military authorities, while realising



Mr. W. B. R. Moorhouse landing on the streamlined R. and M. monoplane at Brooklands.

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that strategical reconnaissance is the sphere of the fast single-seater, are positive that for tactical reconnaissance it is necessary to use two-seaters, carrying a trained observer having control over the pilot. The published conditions of the forthcoming Austrian military aeroplane competition specify that all aeroplanes entered must be two-seaters. A certain section of military opinion goes further and demands three-seaters, that two pilots may be carried in addition to the observer.

The Italian Army, though it possesses a number of single-seaters, prefers the two-seater for actual service. Gavotti, who is flying an Etrich monoplane with the Italian Army of Occupation in Tripoli, states that for work over the open desert the single-seater was enough; but when the view was broken up by a number of oases and interrupted country, an observer was necessary in addition to the pilot. By which one may infer that an observer would be necessary in European warfare.

In the case of purely scouting machines, the difference in speed between single-seaters and two-seaters driven by engines of equal power is not great enough to matter much. Under normal conditions the single-seater, I am given to understand, is scarcely ten per cent. faster than the two-seater loaded with petrol and oil for the same radius of action.

One is naturally speaking so far only of machines used for Staff purposes, and not of aeroplanes attached to the Artillery to assist in finding ranges, etc., or to the Cavalry for preliminary scouting. The single-seater would be quite adequate in both cases. But, as in England we have only a few aeroplanes at the present moment, Staff work alone can be considered. As we increase our aerial fleet we can arrange other work for our aeroplanes.

Speed is no drawback to observation if the flight is made at a sufficient height. The probable effective altitude at which reconnoitring flights will be made will be between two and three thousand feet. At this height the progress over the land, even though the flying speed be over seventy miles an hour, seems very slow indeed. There is ample time to make the most elaborate notes and sketches. A modern army in the field covers an area of many miles in extent, over which the aeroplane can cruise until disturbed by opposition machines or gunfire directed with skill sufficient to be annoying.

(*To be continued.*)

French Military Aviation.

The future of wireless telegraphy and its adaptation to use on aeroplanes are of the greatest importance to the aviation section of any army. The French military authorities are paying particular attention to the subject, and several trials of varying value have been made during the past few months.

A wireless installation was fitted, some weeks ago, in front of the passenger's seat on a Savary biplane at Chartres, and several journeys have been made with the object of transmitting messages from the aeroplane to the ground. The installation was specially constructed by Ph. Pellin et Cie. for the Société la Radio-Télegraphie. It is remarkably neat, for it weighs in all only 70 lbs., and is yet a complete wireless installation. It consists, firstly, of a 110 volt alternator connected by an ingenious clutch to the flying motor. The 110 volt current is transformed to 30,000 volts by an ordinary commercial transformer, and the secondary current is employed to charge a special condenser. The oscillating discharge is originated by a highly improved rotating gap, which transmits waves making a perfectly regular musical note. The aerial takes the form of an aluminium wire 100 ft. long, which the operator can unwind as he desires, a special safety attachment allowing him to cut the wire in case of need. All the accessible parts of the aerial and gear generally can be touched without fear of shock, as the only currents traversing them are of so high a frequency as to be entirely harmless.

Long and detailed messages were received by Lieut.-Aviator Cheutin at the Chartres Aerodrome from the above-mentioned Savary biplane during a cross-country flight of an hour's duration. The wireless operator was M. Rouzet, of the Société la Radio-Telegraphie, piloted by M. Frantz. Particulars of height, speed, direction, observations on the state of the air, and rough topographical notes on the country traversed were sent with unfailing accuracy. This demonstration is of high value from a military point of view. It is regrettable that as yet no method of receiving messages by wireless on board an aeroplane in flight has been devised. [It has just been done at Brooklands.—Ed.]

The Moroccan Section of the French Air Corps is daily increasing in size. In addition to the section at Casablanca under Lieut.-Aviator Van den Vaero, that at Fez, which left France on March 15th, is hard at work. The section to be stationed at Oudjda is leaving Chalais Meudon this week. The officers attached are Lieut.-Aviators Jeannerod, Bruncher, Pierra, and Gourlez. The aeroplanes to be used are four Deperdussin monoplanes, two of them being single-seaters with 50 h.p. Gnôme engines, and the other two being two-seaters with 70 h.p. Gnômes.

Lieut.-Aviator de Briey made a cross-country flight of great excellence on May 9th, covering in the course of the day a distance of 700 kilometres. Flying a Gnôme-engined Deperdussin monoplane, he left the military aerodrome of Saint Cyr at 5.50 a.m. and flew towards Rouen. Passing round the outskirts of that town, he then altered his direction and flew north towards Crotoy, where he landed at the Caudron aerodrome. After an hour's rest he left for Reims, flying by Abbeville, Douai and Laon, where he stopped for petrol at 1.20 p.m. Later in the day he flew on to Reims. He covered the entire distance of 700 kilometres (435 miles) in 8 hours 20 mins. actual flying time.—W. E. de B. W.

French Naval Aviation.

The supplementary credit of 500,800 francs (about £20,000) has just been passed by Parliament. This money is to be spent on the improvement of the naval aerodrome at Frejus and in the purchase of new aeroplanes. A sum of 200,000 francs is set aside for the latter purpose.

The *Foudre* (aviation mother ship) is now moored at Sainte Raphaël, a few miles from Frejus. Next week it is intended to carry through a series of experiments with hydro-aeroplanes.

There is a Voisin biplane (*Type Canard*) with a 70-h.p. Gnôme, fitted with floats, stationed at Toulon. It is later to be taken aboard the *Foudre*. Lieutenant de Vaisseau Cayla will act as pilot.

The new tests laid down by the Ministry of Marine for all aeroplanes supplied to the Navy are as follows:—(1) The aeroplane must start from land and from water bearing a weight of 200 kilos (441 lbs.), including pilot, passenger, petrol and oil, and a certain amount of repairing material. Enough fuel is to be carried for a two-hour flight. (2) A flight must be made of at least half an hour at a height of 100 metres, and the machine must alight at a previously-stated place. Four of these flights must be made and the machine must alight in rough as well as smooth water. After these four tests, a continuous flight of one hour must be made. (3) Three landings must be made on the deck of the *Foudre*.

These tests come into force after the second week in May.—W. E. de B. W.

German Military Aviation.

The Ministry of War has semi-officially announced that the pension regulations of the Imperial German Army will shortly be altered that officer aviators, injured or killed while flying, may be treated as if on active service with pensions and compensation allowances accordingly.

The Budget Committee of the Reichstag allowed on May 7th the extra grants in favour of the Aviation Corps of Prussia, Saxony, and Wurtemberg.

The Henkell Champagne Company have presented a sum of 100,000 marks to the Ministry of War for the purchase of Army aeroplanes.

The officers selected for aviation duties are trained, as has been stated before, at the private schools of the different makers supplying aeroplanes to the Government. A payment is made of 5,000 marks for each officer so trained. If this be true, the training of military aviators must be a highly profitable occupation.—W. E. de B. W.

Military Aviation in the U.S.A.

The Aviation Section of the Signal Corps left Augusta, Georgia, where it had been in winter quarters since November 29th, last year, on April 1st, and arrived at College Park, Maryland, a day later. The corps has now in its possession seven aeroplanes—three Curtiss (one of them fitted with dual

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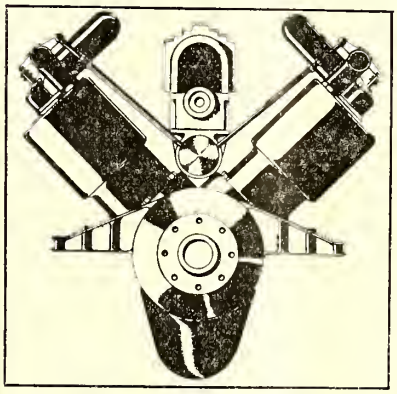

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control), three standard Wrights, and one Burgess Wright—all of them biplanes. Four Wrights and one Burgess Wright are to be delivered shortly.

The dual control Curtiss biplane, which was delivered late in March, underwent the greater portion of the tests insisted on by the War Department at Augusta before the corps left for College Park. Welch, who was piloting the machine for the Curtiss Company, failed in the weight test (to raise a weight of 450 lbs. to a height of 2,000 ft. in 10 minutes). A new trial will be made at College Park. This machine was packed for transport in 35 minutes, and was re-erected in 55 minutes. The dimensions of the biplane are:—Surface, 286 sq. ft.; length over all, 27 ft.; span, 37 ft.; chord, 5 ft. Motor, 8 cylinder (4 in. by 5 in.) 75 h.p. Curtiss.

W. E. de B. W.

Austrian Military Aviation.

The conditions of the forthcoming military aeroplane competition in Austria have at last been issued. No date is stated, but the scene of operations is to be Fischamend. Each machine is to be able to make a single flight of a minimum distance of 200 kilometres, carrying the pilot and one passenger, and, of course, a sufficiency of oil and petrol.

It is required that each machine be able—

(1) To rise at a rate of 1,000 metres in 15 minutes;
(2) To become stationary after landing in less than 60 metres;
(3) To rise from and alight on all surfaces required by the military authorities;
(4) To be taken apart and packed or to be unpacked and assembled in half an hour.
(5) To fly in a wind of 15 metres a second (30 m.p.h.) at a speed of from 60 to 70 kilometres an hour.

The materials employed in the construction of all aeroplanes entered for the competition must be non-inflammable. The different parts of the aeroplanes must pass tensile, bending, tortional, and shock strains as specified by a military commission. The motors must be run at normal power for 5 hours, with and without a propeller, at an angle of 10 degrees below or 15 degrees above the horizontal.

Entries have been received from the Autoplane (de Pischoff) and Etrich firms, and from Herr Kaspar of Pardubitz and Herr Bomhardt of Berlin.—W. E. de B. W.

Italian Notes.

Venice, of all places most suitable for them, does not appear to have yet seen an aquaplane, which is strange, in view of the fact that the ordinary aviator seems to be for ever turning his eyes towards Venice, Captain Novelli's recent cross-country from Aviano to Turin, Widner's ultimate success after divers attempts to cross the Adriatic, the Cobioni exploits, and the nearness of the large military school having given the city an abnormal prominence in aerial feats.

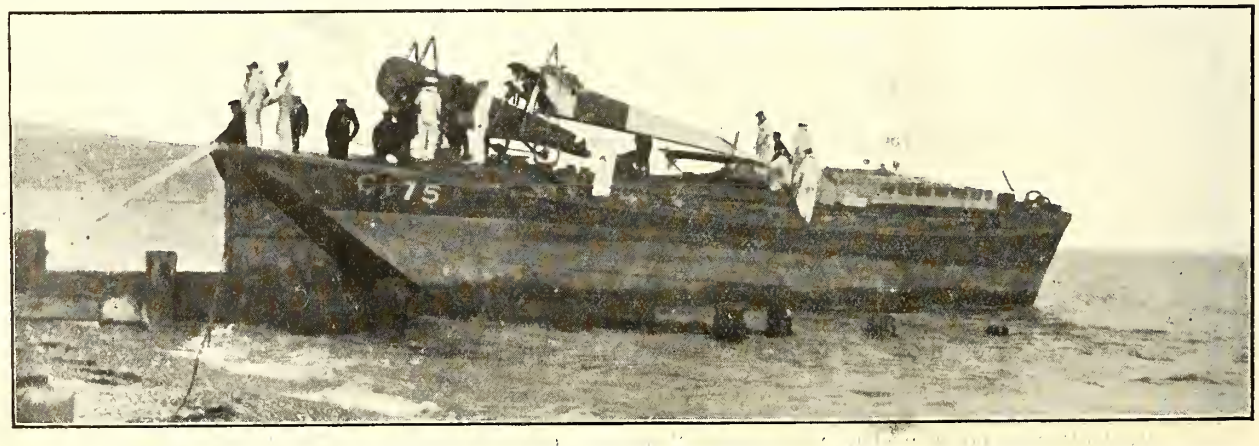
As well as Venice, there are other districts inland of enormous area where water is the only natural landing-place; but, so far, only the Services have done any hydro-aeroplane experiments. Perhaps the national subscription, which is now at the million franc stage, will be applied to make good this lack of progress.

Following Cagno, Piazza (who is named as probable commandant of the new military training ground at Mirafiori), Rossi, and others, Lieut. Gavotti is now home on leave, and explains why he ceased flying his Etrich during these last months and took to a Farman, on which machine he got his ticket at Pordenone in days of old. The sand and restricted space available made landing—and, I suppose, also getting up—dangerous in that most windy of all climes. I hear that a new Turin-built rotary engine is being tried by the Army people at Aviano, and that Lieut. Antonini will shortly take a Bristol to the war.

The appearance of M. I. is imminent. She will, if successful, take unto herself six other dirigibles, all fitted with four propellers and implements of war. We have now somewhere about one hundred Air Battalion officers, and machines are being delivered from this country and abroad at an astounding rate.—T. S. Harvey.

Commands in the Royal Flying Corps.

It has been officially announced that the commander of the Military Wing of the Royal Flying Corps is to be Captain F. H. Sykes, 15th Hussars, General Staff, to date from establishment. Probably his appointment will come as a surprise to many, as Captain Sykes has not figured prominently among military aviators, not being even attached to the Air Battalion, and as his seniority as captain only dates from October, 1908, he is comparatively junior for the position. Nevertheless, those who have been closely in touch with the affairs of the Air Battalion, and, more recently, of the Royal Flying Corps scheme, have recognised that he would be certain of a post of considerable importance. It must be remembered that in these early days of the air service appointments must be made purely by selection, and though Captain Sykes is low in the list of captains, he has had a long and distinguished career in the Service. Strange things happen under unusual conditions, and the writer believes he is correct in stating that when, as Mr. Swift McNeill put it, "peace broke out" in South Africa, it was discovered that General Sir Percy Girouard, in charge of all the railways and their belongings, was, in fact, a subaltern of Canadian Militia, his various steps being sundry forms of brevêt, temporary, or local ranks. However, Captain Sykes, whatever special promotion is given to him, may safely be said to have deserved it for he is one of those very quiet men whose exploits are known chiefly to War Office pigeon-holes. There is a rumour that he is one of the only two white men who have ever walked from Pekin to Simla; at any rate, he knows more and says less about the Northern Frontier of India than most men in the Service. He is quite a sound flier, though one might be quite well acquainted with him without gathering that he had ever seen an aeroplane. And he has rather more knowledge of the theory of flying machines than most people in the industry itself. Whatever mistakes have been made in the formation of the Royal Flying Corps and its appurtenances, this appointment is not one of them, though there may be some surprise that a staff officer should be appointed, and it may seem hard that one of the officers who have worked so hard either on aeroplanes or dirigibles, through the lean years of military aviation, should not have had the job. The other appointments will probably be gazetted during the next few days, and there will be some surprises among them. Who is to be Commandant of the whole Central School may not be officially announced for a while, but the appointment will be quite subversive of general ideas on the subject, and the officer who is to command the military wing at the School itself is sure to be a very popular selection.



The lighter ready to land the Short and Deperdussin monoplanes at Lodmoor. [*Photograph by Mr. Newlyn Roberts.*]

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General Henderson on Military Requirements.

The meeting of the Aeronautical Society on May 8th was in many ways the most important which has yet taken place, and those constructors and aviators who stayed away missed important information as to the requirements of the Army, which the present writer fears he can supply but inadequately, as he must, for lack of space, omit some of General Henderson's illuminating explanatory remarks, though it is hoped that these notes may give the chief points of his arguments.

It is to be feared that some of the more notable absentees stayed away for fear of being called upon to speak, under the peculiar system of catechism which has been adopted by certain members of the council of the Society.

It is to be hoped that this system of forcing the discussion may be abandoned at future meetings in favour of leaving the members to volunteer their remarks, or, at any rate, of giving them notice some days before that they will be expected to speak.

In the absence of the C.I.G.S., Sir John French, the chair was taken by Lieut.-Gen. Sir James Grierson, who congratulated Colonel John Seely, the Under Secretary of State for War, who was on his right, on his wonderful performance in achieving so much since his announcement of the Government's policy at the Aeronautical Society's meeting in December.

Brigadier-General Henderson, C.B., D.S.O., then proceeded with his lecture. He said he had no intention of competing with designers, but merely wished to put forward some suggestions as to the requirements in scouting aeroplanes. He would speak of the various types solely as instruments of war.

Reconnaissance in the past had always followed one of two methods. Either a large force went out prepared to fight for its information, or a small body—possibly one man—went simply to find out the position. At Crecy four French knights went to find the position of the English. At Poitiers, ten years later, the Black Prince sent out several hundred men, who charged into the rear of the French, and brought back a number of prisoners. Marlborough used large bodies of Cavalry; Wellington used single officers mounted on the best horses.

It was only necessary to speak of large forces in reconnaissance because they were the best obstacle to small forces, and because a scout's greatest danger was from other scouts similarly equipped. Large forces were slower, noisier, and more cumbersome.

A scout's sole duty was to get information and bring it back. When he got the information he had only done part of his duty, which was not complete till he had passed it on.

The most important qualities of any animal, vessel, or machine used for scouting were invisibility, silence, speed, and staying-power. The range of an aeroplane depended on its speed, reliability, and the fuel it could carry. Its engine must be the very best available, and it must use the best petrol and oil. As to range, he would not guess at a reasonable standard, but for the present it need not exceed the records set up in times of peace. The present use of air scouts was purely speculative. Reconnaissance, when the opposition was known, was a simple matter; but war in the air was another proposition. We could only use present knowledge and common sense.

As to the types of machines required, General Henderson thought we would develop two types—one for fighting and one for scouting These might ultimately merge into one type, or they might evolve into half a dozen types. The machines would be needed for two purposes—to penetrate the enemy's lines to get information, and to block the enemy from getting information. Frankly, he had not yet seen a machine fit for fighting. Constructors seemed too busy getting their machines to fly at all.

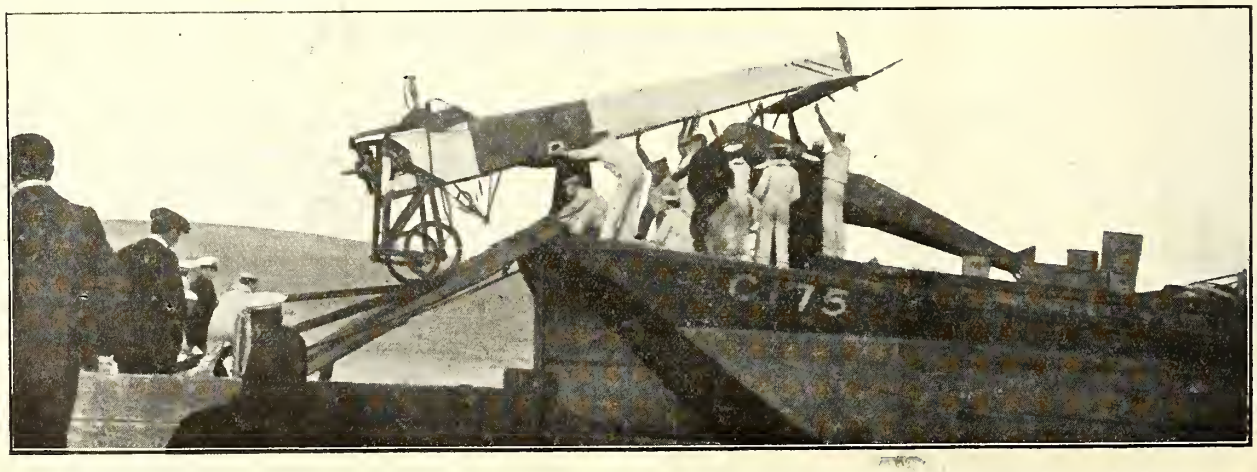
The fighting aeroplane should have an open front, free from struts and stays, and there should be no tractor screw. General Henderson admitted that the fighting machine might also become a scouting machine. One difficulty of the scouting machine was that the speed was already so great as to make landing difficult. One of the problems, therefore, was to increase air speed while decreasing landing speed. Light machines were safe to land at speeds which were impossible with heavy machines. Speed itself was only relative, as it depended on the speed of the enemy's machines; but under present conditions the scouting machines must have either a variable speed or an entirely new landing arrangement.

Considering the scouting machine only, there need be no limitations in design; the designer could put as many screws and engines on it as he liked to make it faster. The scout would be used for first operations only. If a solitary fighting machine were sent out, and were met by superior forces, it would have no extra speed to escape them. The air scout had one great advantage over the scout on the ground. A scout, when discovered, could only escape in two dimensions, though, as a matter of fact, he did know of one scout who had slept in the engine-room of a mine, remarking that if he were discovered the mine would be useful as a means of escape downwards. If the scouting aeroplane climbed quicker than the enemy it would be very hard to catch. Also, the scout must manœuvre quicker than the fighting machine. The problem of invisibility might be approached either in material or colour, and he was surprised that no effort had been made to achieve invisibility either from above or below. Silence was easy to get.

Non-Essentials.

Turning to the non-essential features of the scout, General Henderson said that an absolutely clear view was not essential; at least, efficiency must not be sacrificed to it, otherwise it would be like sending out a scout on foot with a step-ladder. He also did not regard the ability of the machine to start out of a ploughed field as an essential. A landing in the enemy's country might be regarded as a failure of the enterprise, and the scout might as well abandon his machine and start to get back by any other means available. He had known many scouts start out on good horses and come back on very bad feet.

Good gliding was desirable, but it was not essential if the machine was efficient in other ways. Armour, also, was not essential if it impaired mobility. It was not essential to carry



[*Photograph by Mr. Newlyn Roberts*]

The "Hibernia's" blue-jackets landing the Short monoplane from the lighter at Lodmoor.

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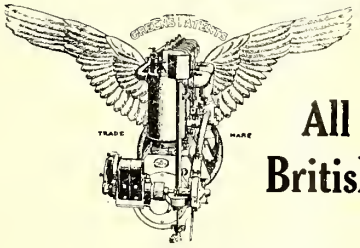

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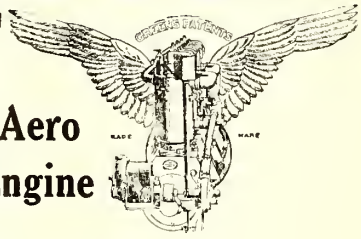

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two men instead of one if speed had to be sacrificed, as it was better to succeed with one man than fail with two.

If one supposed a scout had to cover a fifty-mile circuit, he would get up in his own country, and, with a noiseless engine and comparatively invisible plane, could do the trip in half an hour. If discovered, he ought to be able to get home before the enemy's fighting machines could get off the ground. If he were met in the air, a circuitous chase or a climbing contest would ensue, and the scout would have a good chance of success. If two scouts of a similar type met, fighting would be unlikely, judging from experience on the ground. If designers would consider these points, his remarks would have served their purpose.

The inexperienced were prone to lay stress on the non-essentials, and, after all—to quote a very successful scout—the only way to learn scouting was to go on reconnaissance, and the only way to learn reconnaissance was to go scouting.

The Discussion.

In the discussion which followed, Colonel Capper held that a view all round the machine was not inconsistent with speed and ease of manœuvre. Also, he did not agree that a light, fast machine was unable to attack a heavy machine, as it might oust the heavier machine by quick manœuvring. He thought air scouts might fight. On land, scouts, if they met at all, met between armies, not behind; but, if a scouting plane were observed over an army, he thought one would always find officers willing to take up another scouting machine to prevent the enemy from getting back with information.

General Arbuthnot said that he was of the opinion that the scout should be independent of the pilot, chauffeur, or whatever one would call him, so as to able to concentrate on his own work. He thought that more attention should be paid to engines, especially to silencing. Makers of aeroplanes were too liable to fit engines they knew, instead of experimenting with the best engines.

Captain Wood, referring to the question of colour, said that if a machine went up in the grey dawn and arrived over the enemy in bright sunlight, it might be difficult to change its colour to suit the altered conditions. Attempts made in France to give aeroplanes protective colour had been unsatisfactory, as they always looked white when high up. Silencing of the engines was being attained with success.

Captain Burke remarked that at the end of it all it came back to the question of the man, and what his nerves would stand. He was of the opinion that in any war the aerial forces on one side should start by laying out those of the enemy, and then they could start scouting. Flying in a wind was trying both on mind and muscle, so that the machine must be easy to handle; the less strain on the pilot the better the work he could do.

Mr. Low, speaking entirely from the designer's point of view, said that in naval design, if more guns and armour were required the designer simply asked for more money and increased his displacement. In the aeroplane, if bigger machines were needed, the factor of safety would be decreased. Improvements in the engine depended on the production of new steels, or of a new explosive better than petrol. He pointed out that after impressing on everyone the improvements to be made in aeroplanes one had to adopt the apparently contradictory position of saying that one must remember their limitations.

Captain Sykes said that in Tripoli the best distance done by a scouting aeroplane was 90 miles out and 90 back, but it must be remembered that the Italians had nothing up against them. In future much bigger flights would be needed. In Tripoli, bomb-dropping was tried at first and found useless, but after giving it up for two months it had recently been started again. The Italians at first flew at a height of 2,500 ft., but had lately come down to about 1,500 ft.; only one aviator had been hit, and then it was because he had been brought down to 900 ft. by a down current.

Colonel Rawson said that he was sorry that General Henderson should have made one remark, namely, when he said we must have the best petrol. Petrol might be good, but it was not the ultimate power producer. He had seen a car recently which had run some thousands of miles on liquid air, and he learned that the chief trouble about it was that the intense cold caused the metal of the engine to fracture under shocks. This could probably be cured by using new metals.

Colonel Holden said that with a dirigible one had better chances of observation. It was difficult in any case to be sure that what one thought one saw was the real thing. Observers could easily be deceived by simply turning the surface of the ground over to give it the shape, when seen from above, of guns or other things. At present one had very little knowledge of what one could see at 40 to 60 miles an hour. As to silence in engines, the best known engine, the Gnôme, was the most difficult to silence. All hoped to see it superseded. Still, no engine at full power could be absolutely silent.

Mr. Mort wanted to know at what height scouting was to be done before he could say whether the engine could be made silent or not. The engine might be inaudible at 2,000 ft. without being absolutely silent.

Mr. Dunne agreed with Captain Burke that the first thing in war would be a big aerial battle, but a machine six miles per hour faster than a fighting machine would be quite safe and could go clean through the fighting fleet. If the pilot had a fairly clear view, a second observer would not be essential, and silence was not essential if it was going to hamper speed.

Mr. O'Gorman said that he had no doubt of the value of speed to a scout. If one put an effective 80 horse-power into a scout, one could get 100 m.p.h., but with the same engine in a fighting machine one would only get 60 m.p.h. The speed of the scout would, however, be limited by his landing speed. He speculated that a 200 m.p.h. machine might be evolved, and in this country it would never be very far from the sea as a landing place. Mr. Lanchester was already working on the problems of very high speeds. It was also worth while, now that Government funds were available, to experiment in the possibilities of radiant power. On the question of landing, he thought a scout might perhaps find it worth while to land in the enemy's country in order to, as he put it, "cut lines of communication," a gunner officer in the neighbourhood of the writer suggested *sotto voce* that presumably he would carry a brigade with him and drop it.

Mr. Berriman said that if variable speed were needed it would be difficult to attain; it entailed variable area and it would probably be cheaper to vary the whole attitude of the machine to slow down on landing.

Mr. A. V. Roe said that he had that afternoon tested a new military Avro to climb 2,000 ft. in six minutes.

Mr. Handley Page, on the subject of coloration, said that in the sky the machine always intercepted light and would be visible, but that on the ground one could paint it the colour of the ground. If one was going to land at high speeds some form of brake on the chassis would be needed.

Mr. Ledeboer said that silencing the engine was not the only source of noise, as the whistling of the propeller could be heard at a great distance, though this had been reduced in France by making propellers with flexible trailing edges. However, the machines were always seen long before they were heard. He questioned whether it was necessary for a pilot to return with information. If the machine were fitted with "wireless," one could communicate observations, and this also did away with the need for landing.

General Henderson, in replying, said that a view all round was good when speed was not sacrificed, but it would not do if a clear view entailed a speed of 90 kilometres per hour, while a limited view gave a speed of 90 m.p.h. The colour of machines on top should be the same as the ground on which they intended to alight, and the under surface should be of any colour which would show least in the sky. If he had been lecturing on fighting aeroplanes, he would have been quite in accord with Captain Burke, but it was necessary to find the enemy's fighting machines first, and we should still want light machines for reconnaissance. If liquid air could be used as fuel, everyone would be thankful. The difficulty of observing at high speeds decreased with altitude. The short rifle was supposed to give an effective vertical range of 7,000 ft., but the Italians had found themselves safe at 1,000 metres, so one might say that 3,000 to 4,000 ft. was a fair height. Under 3,000 ft. one would be taking risks. In peace, a machine might be seen before it was heard, but he did not believe that a sleepy sentry would see it first, for, said he, "you would be surprised at what sentries did not see."

On the subject of landing speeds, General Henderson said that if a machine landed once after making its reconnaissance it had done its work, and it only needed to come down in such a way as to let the pilot get out with a whole neck. The machine must be got into the air somehow, but after that it did not matter. On the ground, scouts preferred to have companions, but one man who did his work was preferable to two who failed together. If one could carry an observer, by all means do it. Wireless would be useful provided the observations were effectively passed on.

General Grierson, in proposing a vote of thanks to General Henderson, pointed out that all military vehicles had to be built for their specific purposes and the aeroplanes would be the same.

Colonel Seely, in proposing a vote of thanks to the Chairman, said that General Grierson had special qualifications to preside, as he had been all over the world, and spoke several

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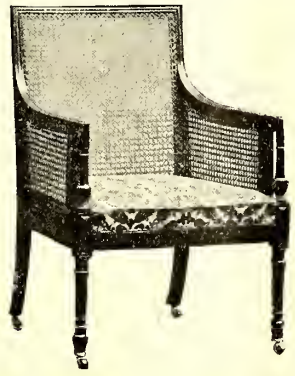

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languages better than his own. Speaking as a student of military aeronautics, he said to the designers that silence, manœuvring power, speed and reliability were what we wanted, and he would add that automatic or inherent stability and great variability of speed were also required. A fortune awaited the man who could make a machine which would hover like a hawk. Given these points, all other problems would solve themselves. Given the power to hover and to receive wireless messages, an aeroplane would become an engine to revolutionise warfare.

Speaking as the President of the Committee which controlled the aeronautical defences of this country, he did want this nation to maintain in the air the supremacy we held in the past on land and sea, and he wanted to attain this at the least possible loss of life. He had counted in that room 97 able and hearty young men, yet only 14 of them were flyers. Why was this? Because of the risks. Until more people fly, there was not enough business to justify the constructors in making the necessary experiments.

Manners and Machinery at the Factory.

It had been hoped that the time was past when it was necessary to keep on girding at the Aircraft Factory officials, but apparently little improvement in demeanour or sense has taken place. On the first count, the writer gathers that when representatives of firms who construct highly successful aeroplanes, but who do not happen to be themselves popular with the officials, visit the "Factory," they are liable to be received with the utmost boorishness by an ignorant understrapper of the type which does not know which way to turn a propeller, but manages to build up a spurious reputation by appropriating to himself the credit for good work done by his more modest colleagues.

On the second point, one would imagine that at a place where so much public money had been poured out as it has been at Farnborough, there would be at least moderately useful apparatus for carrying out the tests imposed by the staff of the "Factory" on machines purchased for the Government. Yet one learns that when a military machine passes its practical flying tests with ease, and is handed over to the officials for the final test of a sand load on the wings, the officials demand that the makers of the machine shall supply the apparatus necessary to turn the machine upside down, and the trestles on which to support it. One rather gathers from this that as there is no proper gantry in the Factory for the purpose of turning machines over, that officialdom does not submit its own machines to this somewhat farcical, and rather dangerous, test; farcical because unless the test is carried to breaking point it is useless and gives no information, and dangerous because if heavily loaded the wings may be so strained that they will break under a flying shock.

It is to be hoped that Mr. Mervyn O'Gorman will, at an early date, spare a portion of one of the two days per week which he allots to the affairs of the "Factory" in exchange for his modest stipend of £1,400 per annum, to the investigation of these points, as they may have quite considerable effect on the supply of machines to the Royal Flying Corps. It may also be noted that no one in any way concerned with the grievances under discussion has mentioned them to the writer. The complaints have come from quite other quarters, which might, perhaps, perturb the comfort of some officials if known.

The Latest Factory Biplane.

On Friday, May 3rd, a new biplane (*B.E.3.*) made by the Aircraft Factory did its first flight, and promised well, both in lifting and speed. It is not quite the same type as *B.E.1.* and *B.E.2.*, having staggered planes and a larger fuselage to allow for a Gnôme engine. The rudder attachment is also an improvement on the other machines. It has a decidedly "rakish" and fast appearance, and is thoroughly up to date in every detail. It seems to fly very steadily and at a very uniform pace, taking the turns without any effort and with very little banking.

It is most likely that in a few days a similar biplane (*B.E.4.*) will also be making its trials. With the four *B.E.* machines, there ought to be a very good show this week-end, when it is hoped that the King will pay a visit to the Factory.

There is no doubt that in Mr. de Havilland the Factory has an exceptionally able designer, and it is to be hoped that his services will be duly recognised. The writer has the more satisfaction in publishing this note as he has not the pleasure of Mr. de Havilland's acquaintance and is judging entirely by his work.

The First Aviator to land in Ireland—Mr. Corbett-Wilson, at Bennett's Hotel, Enniscorthy.

Flying in Ireland.

On Monday last Mr. Corbett-Wilson, who had left Enniscorthy on his way to Kilkenny, via New Ross, lost his way and landed at Fethard (erroneously called Feltham in the English papers), in County Tipperary, so that he is the first aviator in Munster, as well as the first to land in Ireland, and the first to fly across Wales.

Flying the Country.

For the first time in history a man has flown into exile by the way of the air. A M. Nardini, who is an experienced pilot of a Deperdussin monoplane, has been expelled from France for having, it is said, informed the Italian Government that the two aeroplanes belonging to Obre and Duval, which were seized later on their way to Tangier, were intended for the Turkish army in Tripoli. He is also credited with various injudicious remarks on the policy of France in regard to the Turko-Italian War. He is an Italian subject. With that courtesy which has always distinguished even the most plebeian of French Ministries, he has been permitted to take his departure without undue haste. M. Nardini left Villaconblay a few days ago on his Deperdussin monoplane. After the various delays *en route*, chiefly through bad weather, he reached Dover on the morning of May 12th.

Another Strike.

All the pilots at Johannisthal are apparently on strike, having refused to take out any machines on learning that their request to have a doctor permanently stationed on the ground had been refused.

Flying in Japan.

Mr. Atwater, a U.S.A. pilot, has been giving some very successful exhibitions at Yokohama on a Curtiss, before members of the Japanese Imperial family and various high military and naval officers. The Government ordered eight machines.

The Second May Meeting.

Once a week for the last month or more there has been one day on which it has been possible to fly comfortably all day long, but that day has never been a Saturday. Consequently, the London Aerodrome people had again to be content with an incomplete programme on Saturday. Until about 5.30 p.m. the wind was blowing up to fully 30 m.p.h. in gusts, so competition flying was impossible. However, the crowd of 4,000 to 5,000 people who were present were entertained by some very fine exhibition flying. Mr. Grahame-White on his Nieuport, only just back from Weymouth, and still only partially adjusted, flew splendidly. She seemed to have a tendency to heel to port, and Mr. Grahame-White told me later that he had his right warp pedal hard down the whole time, and had to get his extra stabilising from the rudder, so quite unintentionally he demonstrated the possibility of doing what he described in the Rawlinson case—flying with a permanent list. Mr. Lewis Turner, on the old Howard Wright biplane, did some wildly exciting circuits, the machine waving like a flag in a breeze. Mr. Hucks, on the Gordon-Bennett Blériot, gave several fine exhibitions, and Mr. Hamel, on the same machine, went up to 800 or 900 ft. and played tricks, the poor old monoplane being wrenched over in the banked turns till it looked as if the tail was going to be twisted off—there was certainly an angle of 15 degrees between the lateral centre-lines of the tail and the main planes. Mr. Hamel discovered a broken rib in the right wing of his own machine, and was only with difficulty dissuaded from flying it in that condition. Mr. Chéreau has often told the writer that the wings ought really to be stripped and inspected, having been lying idle in the damp all through the winter, and having done an immense amount of work since the dry weather set in, with the consequence that the fabric shows quite plainly that the spars have considerable movement. There will be an ugly smash soon if Mr. Hamel does not take more notice of the condition of the machines on which he flies.

About 5.30 p.m., Mr. Hucks on the Blériot and Mr. Turner on the old Howard Wright started for the cross-country race, but the latter was blown down a mile outside the ground, and Mr. Hucks "flew over" alone. Fortunately, Mr. Turner only broke a couple of struts in the chassis and the tail boom and was able to fly back just before dark, after having made a quick repair.

Later on, when the wind had gone down a little, a speed handicap round the course took place. In the first heat Mr. Ewen on the little Caudron biplane had about half a lap start from Mr. Hamel on Mr. Hucks' Blériot, and was only beaten in the run home from the last pylon. Mr. Hamel, in passing, cut rather close in front of him, with the result that Mr. Ewen had to come down to escape being blown over by the wash of the Blériot. Mr. Ewen lodged an objection, and the matter was settled by the judges allowing him to fly in the final. In the next heat Mr. Valentine started some few seconds in front of Mr. Hucks; but, owing to his engine having been over-doped, he rolled the first quarter of the lap, and only got going properly at the third pylon, when Mr. Hucks was already well on the way to the second pylon; but from that point Mr. Valentine gained steadily, and won easily.

In the final, Mr. Ewen had got well away when Mr. Hamel started. Just as the latter was on the point of leaving the ground, his left wheel buckled, the machine slewed to the left, and, owing to the switch not acting quickly, rushed round in a circle, and went into Mr. Grahame-White's Nieuport, which was standing behind the pylon. The propeller hewed its way into the back of the Nieuport's left wing, right up to the front spar, scattering bits of wing and propeller for yards round. Fortunately no one was hurt, and, though it is cruel hard luck on Mr. Grahame-White having his best machine disabled, it was certainly a good thing that the Nieuport was in the way, otherwise the Blériot would have turned into a group of people (most of them unnecessarily) standing round the first pylon, and would probably have slain someone.

For some unknown reason the judges stopped Mr. Valentine from starting, and the whole race was declared off, though, as a matter of fact, Mr. Ewen and Mr. Valentine ought to have fought it out between them.

While this race was in progress, Mr. Crawshay, who revealed himself as a Blériot flyer of very high class, made a trip over the surrounding country at a height of between 2,000 and 3,000 ft., disappearing to the north and coming in from the south just when the crowd were running over to look at Mr. Hamel's smash. He landed with a splendid glide over about 1,000 ft.; but his landing was baulked by the people on the ground, so that he damaged his chassis somewhat.

It was unfortunate that Mr. Ewen's Caudron monoplane was not in flying order, as it would have put up a very

Mr. B. C. Hucks in the Gordon-Bennett Blériot at Hendon on Saturday.

fine race against the other monoplanes; but, a day or two before, some of the cattle which graze on the aerodrome had walked into Mr. Ewen's shed, and, presumably thinking, from its bluish colour, that it was made of stone, proceeded to use it as a "God-bless-the-Duke-of-Argyll," with disastrous results to the wings. However, it is hoped that it will be ready again by next week.

As usual, there was quite a good crowd at Hendon, and, judging from the remarks one heard when walking among the crowd and from the hearty applause which greeted every flight which was really good, the Hendon audience is rapidly becoming educated into a thorough appreciation of good flying.

Quite the right class of people are going to Hendon, also; for I noticed a number of officers of the Royal Flying Corps and several high officials of the Admiralty and War Office, as well as well-known men in the City, among the crowd on Saturday, and it is precisely men of this kind that constructors of to-day ought to do their best to interest in their machines. It should be recollected that the Grahame-White Aviation Company, Ltd., offer free shed accommodation for the week-end to any aviator bringing his machine to compete at these meetings, so constructors and pilots who are anxious to make a name for themselves and their machines will be neglecting their opportunities if they do not put in frequent appearances at the Hendon meetings.

There is, as usual, another meeting on Saturday next. The following Saturday and Whit-Monday there are some big competitions taking place, including a race for £50 in cash on Saturday and a 100 guinea cash prize on the Whit-Monday, together with very useful second and third prizes in the big events, and a number of other events with smaller prizes, so it will pay pilots well to compete at Hendon throughout the Whitsun week-end. It is to be hoped that a really good response will be made to the Hendon Aerodrome's efforts to increase public interest in aviation, and it must be said that they are already succeeding in this respect beyond expectations.

The Whitsun Meeting at Hendon.

The Aeroplane has received particulars of the Second London Aviation Meeting, which is to be held at the London Aerodrome, Hendon, on Saturday, May 25th, and Monday, May 27th.

A very attractive programme has been arranged, with really good cash prizes, and it is expected that many of the well-known aviators in this country will compete. The following are the events:—

On the Saturday, May 25th, at 3.30 p.m.:—Event No. 1: Cross-country team handicap open to all types, about 20 miles. First prize, Silver Cup and 15 sovereigns each; second prize, 5 sovereigns each. Event No. 2: Monoplane speed handicap, 12 laps, about 18 miles, for the Barlow Trophy and cash prize, presented by H. Barlow, Esq. First prize, valuable trophy and 50 sovereigns; second prize, 20 sovereigns; third prize, 10 sovereigns. Event No. 3. Altitude contest for the St. Ivel Cup and cash prize.

On Whit Monday, May 27th:—First event, at 2 p.m., Relay Race, First prize, Silver Cup and 15 sovereigns each; second prize, 5 sovereigns each. Event No. 2: Passenger-carrying speed handicap (8 laps, about 12 miles). First prize, Silver Cup and 25 sovereigns; second prize, 10 sovereigns. Event No. 3: Cross-country handicap, open to all types (about 45 miles), for the Geisler Trophy. First prize, Geisler Trophy and 100 guineas; second prize, 25 sovereigns; third prize, 10 sovereigns. Event No. 4: Grand speed handicap (12 laps, about 18 miles), open to all types. First prize, Silver Cup and 30 sovereigns; second prize, 15 sovereigns; third prize, 5 sovereigns.

Exhibition flights will be given on both days, and also on Sunday, May 26th, by Mr. C. Grahame-White and most of the competitors.

Official Encouragement at Brooklands.

The Second Aviation Handicap for prizes of £75, £30, and £15, to be held at Brooklands on Whit-Monday, will be run in heats, further prize money being added, making a total of £200. In each heat there will be prizes given of £25, £10, and £5, provided there be at least six starters in each heat (which hardly seems likely). The first four in each heat (supposing there be so many) are to compete in the final. No competitor can take more than one prize. Winners of the final heat will therefore have the option of taking the prize offered for the main race or the prize offered for one of the heats. The prizes not taken by the first, second, or third competitors will be allotted to the other competitors in order of finishing, whether in the heats or in the final. From this one may gather that quite a number of entries are expected, say twelve at least; but it is rather hard to see where they are to come from, as the cross-country races have, so far, only produced five or six starters. One would like to know, also, what distance the race is to be, and over what sort of country; for, while £75 may be a munificent prize for an aerodrome handicap, it is not much temptation to risk £1,000 worth of machine over twelve or fifteen miles of the country round Brooklands.

Mr. Grahame-White flying the Nieuport over the Caudron biplane on Saturday.

The First Interchange of Wireless Messages.

So many claims have been made, and there have been so many rumours of an interchange of wireless messages between the aeroplane and the ground, that it is well to put on record the first thoroughly authenticated case. For some time the Marconi Company have been experimenting with the Flanders monoplane at Brooklands, testing the best method of stowing their apparatus and of fixing aerials. Several small tests in the way of transmitting from the machine have been made, and on Wednesday of last week Mr. Fisher took up a clockwork sending apparatus, and it was found that messages were received quite well in the station which has been fitted up in the Flanders shed. Owing to the high wind, Mr. Fisher did not go outside the aerodrome that day. On the following day (Thursday) Mr. Fisher took up Mr. Matheu, of the Marconi Company, the latter having a receiver strapped over his ears, and his head swathed in a woollen scarf to deaden external sounds as much as possible. In the course of a flight of some twenty minutes, during which the machine reached a height of some 800 ft. and went out to about 2 miles from the sheds, in the direction of Chertsey, a regular exchange of messages was kept up between the machine and the operator in the shed. Mr. Matheu kept a note of the messages received by him, and, on returning, it was found that these tallied exactly with the messages sent from the shed, while his answers were correctly received at the shed.

It is highly satisfactory to find that the first genuine interchange of messages should have been made with a British apparatus, carried on a British aeroplane, driven by a British engine, and piloted by a British aviator, though one's satisfaction is marred by the death on Monday last of poor Fisher.

The Week's Work.

Monday, May 6th.

Brooklands.—At Bristol School, Mr. Pizey out with Lieut. Bulkeley, but weather bad. Lieut. Shephard out for first experience of flying in wind.

At Coventry Ordnance establishment, remarkable performance by Mr. Sopwith, who took three passengers up with him for straights, two sitting on lower plane and absorbing 8 h.p. or so each. Later, did circuits with Mr. Manning as passenger, and executed unintended spiral glide through passenger mistaking an order and turning off petrol in middle of a turn. Made perfect landing, started up again, and continued flying perfectly.

Hendon.—Grahame-White School hard at it soon after daybreak, Mrs. Stocks doing straight rolls and Capt. Nicholas straight flights on monoplane No. 4. On biplane No. 3 Mr. Lewis Turner doing straights for instruction to Commander Yeats-Brown in passenger seat. Messrs. Roupelle and Kershaw at straight flights and Messrs. T. O'B. Hubbard and Manton at circuits. On biplane No. 10 Mr. Lewis Turner out for test flights and passenger flights, afterwards making exhibition flights for Press photographers.

Blériot and W. H. Ewen pupils also out.

The Plain (Bristol School).—M. Jullerot first out, followed by Mr. Bendall. Lieut. Pickles then up with former, and Mr. Lindsay Campbell with Mr. Bendall. Messrs. Jennings and Smith-Barry made good flights on tractor biplanes. Capt. Cordner out on school biplane for two circuits. Lieut. Wyness-Stuart got in useful work on one of monoplanes. M. Jullerot out with Lieut. Wall.

Tuesday, May 7th.

Brooklands.—At Sopwith School, Mr. Sopwith up 5 mins. in morning with Mr. Howard Wright, and Mr. Raynham 20 mins. alone, both on Burgess-Wright.

At Bristol School, in evening Mr. Pizey testing Anzani monoplane, but engine not pulling well, so retired.

Coventry Ordnance biplane out flying well when one roller broke on chain. Unusual occurrence in excellent products of Hans Renold. Chain sent to makers, who fitted four new rollers, owing to observing cracks in others, but on return further microscopic cracks seen, so further flying postponed till arrival of new chain with rollers of different hardening. 100 h.p. no light task for chain makers.

Hendon.—At Grahame-White School Mr. Morris making straight flights on biplane No. 3, and Mr. Lewis Turner giving instruction flights on same machine.

The Plain (Bristol School).—Mr. Bendall out testing with Mr. Campbell as passenger, Mr. Pixton later with Lieut. Dawes.

Windermere.—Mr. E. W. Wakefield doing first solo flights on new "Water-bird." Float somewhat deteriorated, but no damage to rest of machine.

Wednesday, May 8th.

Brooklands.—At Flanders School, Mr. Fisher out three times, 5, 15, and 10 mins., sending Marconi messages by clockwork. Receiving station in shed kept in touch up to greatest distance attempted, which was over Paddock. Too windy to go out of ground.

At Bristol School, Mr. Hotchkiss for test, hut gusty. Later Mr. Shephard went for second part of brevêt, flying at 600 ft. and landing with long glide to within 20 ft. of mark. One of best certificate flights yet seen at Brooklands, and Mr. Shephard shows the makings of a very efficient officer-aviator. Mr. Nesham out doing eights, but weather prevented going for brevêt.

At Avro School, Lieut. Parke, R.N., for first trial on Army Avro, flying well, and climbed to 4,000 ft., climbing first 2,000 ft. in 5 mins., landing in series of short glides after 20 mins. flying.

At Deperdussin School, Naval Cadet Robinson good straights morning and evening.

Farnborough.—Lieut. Fox, R.E., up in evening on Air Battalion *F.1.* biplane. Twice round Laffan's Plain and Common. Also one short flight later on, but wind very gusty.

Freshfield.—Fenwick took out all-British Mersey monoplane to Waterloo to call on Mr. Melly at Liverpool School. As it happened, Mr. Melly had started for Freshfield at almost the same moment, and the machines met midway—a rare occurrence for this part of the world. Later on Mr. Melly was taken up as passenger, and expressed unqualified approval of machine and astonishment at its speed. Mr. Thompson was then taken up for three trips. Mr. Thompson is over 70 years of age. (Is this a record age for passengers?). The wind put a stop to further flying, and the Mersey was put up there.

Hendon.—At Grahame-White School, on biplane No. 3, Messrs. Morris and Roupelle straight flights and Mr. Manton circuits. Capt. Nicholas also straights on monoplane No. 4. Mr. Lewis Turner flying straights and circuits on biplane No. 10 for pupils' instruction, taking them in passenger seat in turn, and finally putting Mr. H. C. Biard through second test for brevêt, which flew in fine style, observed by Messrs. H. Barber and W. Ridley-Prentice, of the Aeronautical Syndicate, and Mr. Georges Prensiell, of the Blériot School.

W. H. Ewen School and Blériot pupils also hard at work.

The Plain (Bristol School).—In afternoon Mr. Bendall for solo, after which Mr. Lindsay Campbell made right and left-hands turns with good banking. This pupil only at school a week, and has made remarkable progress. Lieut. Dawes for two solos, Mr. Jennings and Lieut. Wyness-Stuart one each. Mr. Smith-Barry on one of monoplanes.

Waterloo (Liverpool).—Mr. Melly took Mr. Birch on two-seater for 25 minutes flight round surrounding country, incidentally passing over Mr. Birch's home, of which he obtained fairly good photograph from a height of 800 ft. In course of flight Mr. Fenwick was met coming from Freshfield on Planes, Ltd., monoplane. He landed at Waterloo and took Mr. Melly for short flight. Wind getting up, he did not return to Freshfield, so machine was housed in school hangar.

Thursday, May 9th.

Brooklands.—At Sopwith School, Mr. Raynham up in afternoon on Green-Wright for half hour with Capt. Alston, and 20 mins. alone on Burgess-Wright-Green. In evening, Mr. Sopwith up with Capt. Alston on 70-h.p Blériot.

At Flanders School, Mr. Fisher up for 15 mins. climbing to 1,000 ft. Then took up Mr. Matheu, of Marconi Company, with Marconi receiver. Passenger received messages up to maximum distance from shed, about two miles towards Chertsey. Maximum height about 800 ft. during 20 mins. flights. This first time authentic wireless messages have been *received* in an aeroplane. Distinct score for L. Howard Flanders, Ltd.

At Vickers School, Mr. MacDonald out on No. 3.

At Avro School, Lieut. Parke, R.N., started for Farnborough to deliver Avro to Army. Arrived after 20 mins. for 17 miles of very bad air. Landed on Laffan's Plain close to Mr. Cody's shed, where Mr. Cody was getting out the "Circuit" machine which Mr. Parke broke some time ago. In evening Mr. Parke carried out speed, climbing, rolling and one hour flying test. Results being official, cannot yet be divulged. Incidentally damaged a tail-skid previously fitted in a hurry at Brooklands. Otherwise very satisfactory in spite of small wheels which have been disapproved by "experts." New pupil, Mr. "Charlton," joined school and took first instructions.

Brighton-Shoreham.—Mr. B. H. England has now opened school here, and Mr. Oswald L. Melluish to-day joined as instructor, took machine out to test it, and expressed satisfaction at easy control. Mr. H. T. Smith-Newton did straights.

Farnborough.—In afternoon Avro biplane (which had arrived in morning) made a good 55 minute circular flight. Rudder damaged on landing. Captain Burke out on *B.E.1.* (the silent Army biplane) for about 20 minutes, doing good straights.

Freshfield.—After Hardman and Birch were taken up for trips and had commented on the Mersey's steadiness and speed, Mr. Fenwick with Mr. Swaby as passenger returned to Freshfield at about 1,000 ft. In very still air the eight miles were covered in seven minutes.

Hendon.—At Grahame-White School Mr. Lewis Turner opened work at 4. a.m., flying circuits on biplane No. 10 for pupils' instruction, afterwards testing biplane No. 3, which had been fitted with new tail, found too much play on elevator bracket, descended, had same adjusted, and resumed test, machine then flying well. In afternoon Mr. Turner at circuits on biplanes Nos. 10 and 3, afterwards taking up three passengers. Capt. Nicholas making good straights on monoplane No. 4 and Mr. Morris at straights on biplane No. 3, whilst Mrs. Stocks and Mr. Fowler both busy flying circuits on biplane No. 10. During afternoon Mr. Hucks returned from Weymouth, where he had been manœuvring over the fleet, leaving Weymouth on his Blériot at 3.20 and arriving at Hendon an hour and 50 minutes later.

Other schools, Blériot and W. H. Ewen, getting in good work.

The Plain (Bristol School).—M. Jullerot for trial, Mr. Campbell for solo. Mr. Pixton took Major Boyd-Moss, Lieuts. Dawes and Pickles for tuition. M. Jullerot afterwards out with Major Boyd-Moss. Lieut. Hall getting on splendidly with monoplane, did excellent solo for two circuits. Messrs. Smith-

Barry and Jennings practising on various machines, and M. Jullerot took Lieut. Wall.

Waterloo (Liverpool).—Mr. Fenwick left for Freshfield with Mr. Swaby as passenger, after giving two short flights to Messrs. Hardman and Birch.

Friday, May 10th.

Brooklands.—At Sopwith School, in morning Mr. Raynham on Green-Wright with Mr. Hedley 20 mins. and Capt. Alston 15 mins. In evening Mr. Sopwith alone, and Mr. Raynham with pupils.

Mr. Moorhouse on R. and M. monoplane flying prettily in evening, finding wind very steady at 1,800 ft., though puffy near ground.

At Flanders School, Mr. Fisher up for few minutes in evening.

At Vickers School, Capt. Wood and Mr. MacDonald doing straights and circuits on *No. 3*.

At Bristol School, Mr. Pizey up with Lieut. Percival, brother of the flier of the original "Oozeley Bird." Capt. Allen for straights on monoplane. In evening, Mr. Pizey again out with Mr. Percival, and then with Miss Pizey. Mr. Hotchkiss up with Mr. Percival, teaching landings. Later, Mr. Hotchkiss and Capt. Allen testing Anzani monoplane, and former then on biplane with pupils. Mr. Valentine for two pretty flights on military two-seater.

Brighton-Shoreham.—Mr. Melluish out testing in rough wind very satisfactorily.

Farnborough.—Mr. de Havilland up in *B.E.3*, the new biplane (which has just been turned out of the Factory) in the morning and afternoon, doing good solo and passenger flights. Captain Burke out on *B.E.1.* for a short time, doing solo and passenger straights. Mr. Cody also out on his Circuit 'bus. Has been giving most of his time to the construction of his monoplane, which will be out very shortly.

Hendon.—At Grahame-White School Mr. B. C. Hucks out in afternoon on monoplane No. 6, flying several circuits. Mr. Lewis Turner at straights, circuits, and landings *en vol plané*, etc., for benefit of pupils.

The Plain (Bristol School).—Passenger flights given to pupils, but no solo work allowed.

Saturday, May 11th.

Brooklands.—At Vickers School, Capt. Wood and Mr. MacDonald flying *No. 3* in turn.

At Bristol School, Mr. Pizey took Lieut. Anderson (new pupil), and Mr. Hotchkiss took Lieut Percival for tuition. Mr. Pizey went for relay race. Later, Lieut. Bettingdon taxi-ing on Anzani. About 6.30 Mr. Valentine flew over to Hendon on military two-seater.

At Flanders School, Mr. Fisher up 10 mins., and Mr. Kemp later. Mr. Kemp also flying in relay race.

Relay Race at 7 p.m., won by Mr. Sopwith on Blériot, and Lieut. Parke, R.N., on old school Avro; Mr. Pizey on Blériot and Mr. Raynham on Wright, 2nd; Mr. Kemp on Flanders and Mr. Spencer on own biplane, 3rd.

Mr. Moorhouse flying well as usual on R. and M. monoplane.

At Sopwith School, Mr. Raynham on Burgess-Wright flying 25 mins. with Capt. Alston, and 25 mins. with Capt. Hawell. In evening Mr. Sopwith up 20 mins. and Mr. Raynham 30 mins., and Mr. Sopwith on Blériot for relay race.

At Avro School, Lieut. Parke, R.N., testing old school Avro-Green (35 h.p.), now flying well in spite of five dips in sewage farm. Then flew in relay race as partner with Mr. Sopwith.

Brighton-Shoreham.—Mr. Melluish again out doing short flights. Mr. Smith-Newton doing straight flights and half turns in very satisfactory manner.

Hendon.—At Grahame-White School Mr. Lewis Turner early testing machines, etc., for Second May Meeting in afternoon, and flying many circuits with two new pupils, Lieut. B. T. James, R.E., and Mr. Malcolm Stuart, in passenger seat. Meeting in afternoon reported elsewhere in full.

The Plain (Bristol School).—Mr. Bendall first out testing conditions, after which Mr. Lindsay Campbell good solo on monoplane, Lieut. Dawes also two trips. Messrs. Jennings and Smith-Barry each on tractor biplane, whilst Lieut. Wyness-Stuart flew circuit on monoplane. M. Jullerot testing new side-by-side two-seater monoplane, which was found to be working perfectly, and landing extremely light.

Sunday, May 12.

Brooklands.—At Vickers School Capt. Wood and Mr. MacDonald doing straights on No. 3 test Levassor propeller.

At Bristol School Mr. Pizey out with pupils. Lieut. Bettington later for first straight on Anzane.

At Flanders School at 5 a.m. Mr. Fisher out testing, and then Mr. Manning doing straights.

At Blondeau-Hewlett School Mr. Gordon Bell made debut as biplanist, and new pupil rolling. When latter had stopped Mr. Jack Humphrey, on own monoplane, came out, taxied a few hundred yards, taxied back, turned round, and then rolled solemnly into the Blondeau-Hewlett machine, removing top and bottom planes and sundry other parts. Better for those unable to control machines if they would confine their peripatetics to the more open portions of ground rather than endeavour to do the tricks of artillery drivers among school machines pursuing their lawful vocations.

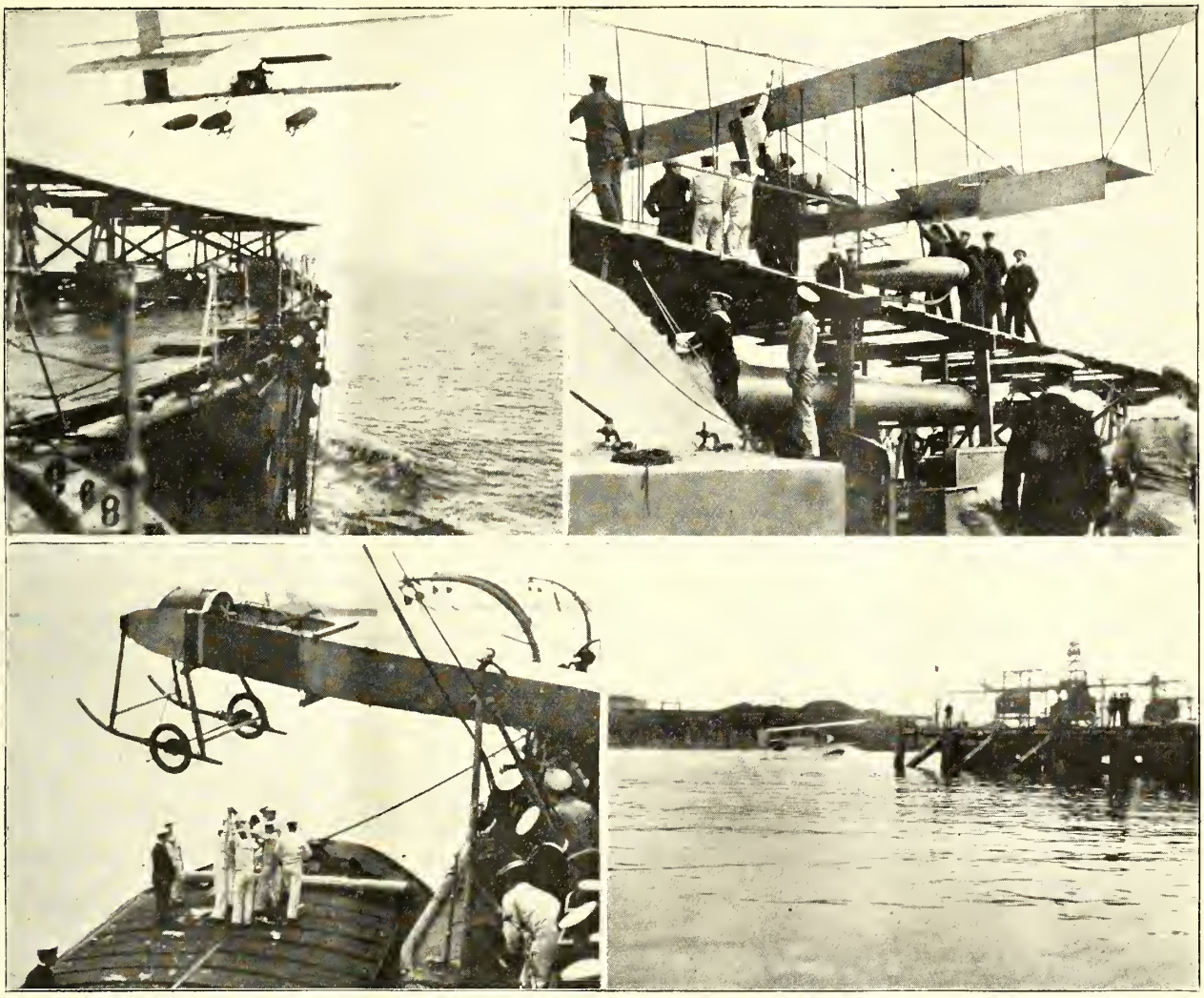
At Sopwith School Mr. Raynham out 15 mins. on Burgess-Wright.

In afternoon thunder, rain, and wind, so only fliers were Mr. Raynham on Burgess-Wright and Mr. Moorhouse on R. and M., both getting very badly pitched about, but giving magnificent display of skill.

Considerable interest created by latest all-steel Blackburn arrived for Mr. Lawrence, of Indian Aviation Co. Had rough journey up part way by road, so looks weather-worn, but seems sound and strong. No sweating or brazing of joints, which are all held by steel clips. Machine fitted with 60-80 Green engine, under big cowl. Distinctly clean, imposing job, though admittedly experimental. Trials awaited with great interest.

The Plain (Bristol School).—Useful work done on Sunday, in which most of pupils took part. Wind, however, was very strong, as during whole week, and it was not advisable to permit pupils' solo flying.

Mr. B. C. Hucks on the Blériot on which he flew from Weymouth to Hendon in 1 hr. 50 mins.



NAVAL MANŒUVRES.—1. Commander Samson just getting off the "Hibernia" on the old S.38. 2. Getting the Short biplane ready to start. 3. Slinging the Short monoplane onto the lighter. 4. Commander Samson on S.41 just landing by the coaling wharf at Portland. Photographed from the deck of the "Hibernia" by Mr. Oswald Short.

The Flying at Weymouth.

Notwithstanding the sensationalism of the daily Press—some of whose more blatant periods are noted elsewhere—quite a lot of useful educational work was done at Weymouth last week. It is to be hoped that some of its more obvious lessons have been learned.

The machines comprised one old-type Short biplane, with safety floats (*i.e.*, torpedo-shaped floats, adapted for alighting only); one 100 h.p. Short tractor biplane, with lifting floats; one Short monoplane, without floats; one Nieuport two-seater, without floats; and one two-seater Deperdussin, with safety floats. The tractor was housed in a shed at Portland, with a launching slipway, the rest being at Lodmoor, in a field from which the public were rigorously excluded. The first flying of the "meeting" was done by the tractor, which Commander Samson took for a spin on Friday, the 3rd, to make sure that everything was in running order.

On Saturday, things started in earnest, Commander Samson and Lieut. Gregory being out on various machines in the afternoon. Later, Commander Samson took Miss Callaghan for a long flight, and towards dusk went out again, this time on the Short monoplane, while Lieut. Longmore was up on *S.41* (the tractor). Sunday was an off day, for the chaplains of the fleet very accurately surmised that deck services would be disturbed with flying going on.

Early on Monday morning Commander Samson was out again on *S.41*, after which he went over to Lodmoor and took out the Short monoplane. Unfortunately he made a rather awkward landing, and put this machine out of commission for the time being.

Tuesday was a blank day, owing to fog.

On Wednesday Commander Samson was first out, and went to look for the Royal yacht, which he sighted near St. Alban's Head. On his return his Gnôme ignition failed him, and he had to come down in the harbour and get a tow back to the slip. Shortly after, Lieut. Gregory, on the biplane, also flew to the Royal yacht, Lieut. Longmore following on the Deperdussin, and the two acting as escort as the yacht came in. During the afternoon all the machines were out again, doing very good work, and Lieut. Gregory successfully dropped a 300 lb. dummy bomb without any ill effect on the machine. Messrs. Grahame-White and Hucks also did some flying.

On Thursday little was done. The old biplane and *S.41* were towed out to the *Hibernia* and taken aboard, and Lieut. Gregory got off from the deck. Later on, Commander Samson and Lieut. Longmore were up, and Captain Gerrard brought out the Nieuport for the first time. Mr. Hucks started for Hendon, which he reached safely, doing the 142 miles in 105 minutes.

Friday was occupied in furious dissembling, *S.41.* only remaining "in one piece," as she was to return up Channel on H.M.S. *Hibernia.*

On Sunday, Commander Samson took her up off Dover, but his Gnôme let him down, and he had to plane down off Westgate. He was eventually towed to Sheerness by a torpedo-boat.

The Death of E. V. B. Fisher.

In this struggle of ours for the conquest of the air, though the percentage of fatalities is considerably lower than that of an army in the field, the conditions are very much those of active service. One's best friends are taken, and those one cares least about are left. By the death of E. V. B. Fisher many of us have lost a very dear friend, and aviation has lost one of its most earnest workers.

The late E. V. B. Fisher.

The accident was primarily a comparatively simple one, being almost certainly caused by Fisher trying to take a corner too sharply with too big a load on the Flanders monoplane. The machine side-slipped and then dived head first from about 100 ft., as many machines have done before without serious results. Unfortunately in this case, the pilot must have been thrown out of his seat by the side-slip and then forward on to the control bar by the dive, for the machine never attempted to get on to her own gliding angle, or to flatten out at all, as she would have done even if the control bar had not been held at all. She struck absolutely vertically, so that the wings were spread out cleanly on each side of her.

Fisher was thrown out some 20 yards from the machine, and killed on the spot. The machine stood on end for a moment and then fell over on its back. The passenger, a Mr. Mason, an American friend brought down to Brooklands by Commander Samson, was covered by the fuselage, and badly burnt, as the machine caught fire, but he was certainly killed before the fire broke out.

As usual, the fire-extinguishers supplied at Brooklands refused to work, though, unfortunately, this would have made no difference in this case.

It will be remembered that Fisher dislocated his left shoulder a few weeks ago, and it is just possible that in the side-slip he may have been struck by the left side of the machine so that his shoulder was again dislocated and his control of the machine paralysed.

E. V. B. Fisher was born at Brighton on December 12th, 1887, and spent most of his youth in Cyprus. He started his connection with aviation by working with Mr. A. V. Roe, and later worked with Mr. Neale, where he and Mr. Flanders first showed their cleverness in design by producing a tiny monoplane which actually flew a little with a 10-h.p. engine. Thereafter Fisher took over the control of the Hanriot, on which he took his certificate and trained several fine pilots, among them being Messrs. Gordon Bell and H. Petre. Fisher's certificate was No. 77, taken on May 2nd, 1911, and the following certificate, No. 78, taken a week later, was that of poor Oxley, who was killed, also with a passenger, at Filey, and by a further coincidence, Oxley was one of Fisher's Hanriot pupils. Afterwards he was with Vickers, Ltd., and lately rejoined his friend Flanders, for whom one must have the deepest sympathy in the loss of so close a companion.

Fisher's only near relative is his father, an old gentleman 84 years of age, and for him, in the loss of his only child, one grieves more than for one's personal loss, though that is sufficiently great.

Our dead friend was not merely a fine flier, but a man of brains, with an unexpected store of knowledge on out-of-the-way subjects. Always cheerful, very witty and ready of tongue, ever ready to help those in need of help, E. V. B. Fisher leaves a blank in one's life which it will be hard to fill.—C. G. G.

The Gilmour Memorial Fund.

So many people have been interesting themselves in collecting for the "Titanic" Relief Fund, that it has been thought well during the past week or two to suspend operations with the Gilmour Memorial Fund, and in consequence there is a very small addition to be notified. The total sum collected now amounts to £178, and it is hoped that it will be possible to raise this to £200 before closing the fund at the end of this month.

Will those readers of The Aeroplane who have not yet sent in their subscription, but who doubtless have the intention of doing so, kindly send them during the next week or so? The result so far has been eminently satisfactory, as it was not so much the intention of the Committee to raise a large sum as to give all Mr. Gilmour's friends and admirers an opportunity of each contributing some small amount to the memory of one who was certainly one of our great fliers, and one of the real pioneers of aviation.

Amount already acknowledged	£175	18	0
Capt. T. Weeding	1	1	0
A. R. Howe-Browne (Rhodesia)		10	6
E. L. Dower		5	0
A. Todd (Lousanne), H. P. Palmer (2/6 each) ...		5	0
C. S. K.		1	0
	£178	0	6

Protection Against Fire.

A recent invention by M. Hugues Simon, a French journalist, formerly living in the U.S.A., and now resident near London, has been very favourably noticed in various American journals. It claims to prevent any danger whatever of a machine firing after a smash. It is impossible as yet to obtain any details, as the patents are not yet in order; but should the device prove successful, it will certainly supply a very urgent need. M. Simon's ideas have been approved by Mr. Edison, and he is anxious to have an opportunity of discussing it with firms who may be interested.

Mr. Cody Flying Again.

Mr. Cody, now quite recovered from his accident, was out again last week, flying the smaller of his machines, the biplane which he flew round the "Circuit of Britain," and which Lieut. Parke damaged when starting for the Manville prize. The machine is apparently now flying as well as ever.

Weymouth to London in Record Time.

One of the finest flights yet done in this country was that made by Mr. B. C. Hucks, on Thursday last, from Weymouth to Hendon. Leaving Weymouth at 3.20 on the old Gordon-Bennett Blériot, now fitted with a 50 h.p. engine instead of a 100 h.p., he followed the South-Western Railway all the way to Brooklands, and thence cut across over Hampton Court to Hendon, arriving there at 5.5 p.m. The total distance is 133 miles, and, though the railway runs approximately straight, probably at least five minutes could have been knocked off by taking a perfectly straight course; but, as it is, the performance is worthy to rank very high indeed, and one wonders what the shade of George III. must think of his favourite retiring place being brought so close to London.

Mr. Hucks told the writer, on his return, that he had quite a comfortable passage, except for patches of fog here and there. It is particularly worthy of note that he flew without a compass, and his only map was one cut out of an old South-Western time-table and stuck on a board in front of him. He said that this was quite good enough for his purpose, as he found the railway lines and their branches were the best guides one could have in this country, which, of course, is true, so long as one happens to be flying along any of the main railway routes and not crossing them.

The Aeronautical Society.

A meeting will be held at the Royal United Services Institution this evening, Thursday, May 16th, at 8.30 p.m., when Mr. F. H. Bramwell will lecture on "National Physical Laboratory Research." On Wednesday, June 12th, at 8.30 p.m., Mr. G. Holt Thomas will lecture on "Hydro-aeroplanes."

At the informal meeting at 11, Adam Street, Adelphi, on May 21st, the subject will be "Aeroplane Control: its Simplification and Standardisation."

MISCELLANEOUS ADVERTISEMENTS

All Advertisements for this column should arrive at this office by 6 p.m. MONDAY, to ensure insertion.

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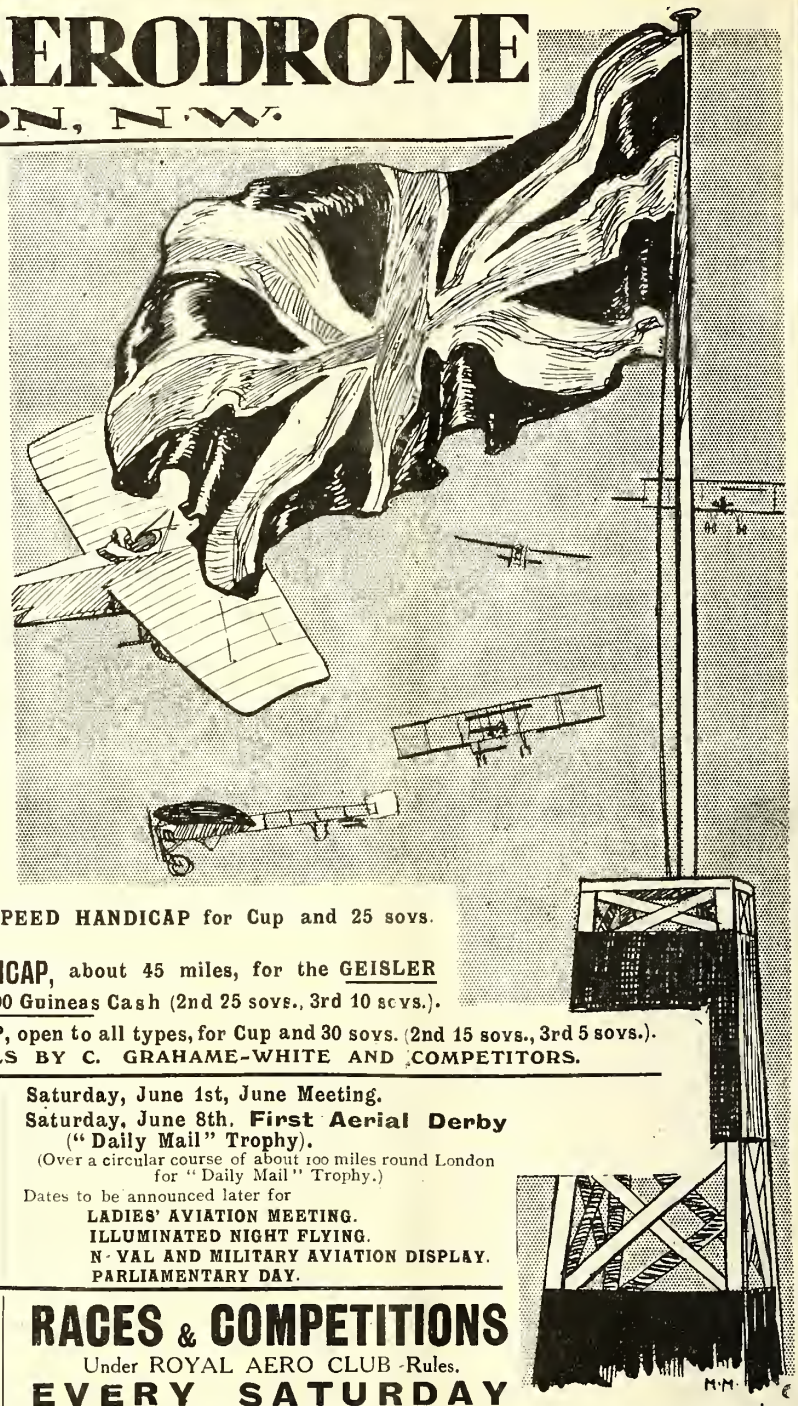

SECOND LONDON
AVIATION MEETING.

Saturday and Whit Monday,
MAY 25th & 27th.
(Weather permitting.) (Entries close May 21st.)

PROGRAMMES.

Sat., May 25th, at 3.30 p.m.

1. CROSS-COUNTRY TEAM HANDICAP. PRIZES £60.
2. MONOPLANE SPEED HANDICAP For the BARLOW TROPHY and 50 sovs. (2nd 20 sovs., 3rd 10 sovs.).
3. ALTITUDE CONTEST for the St. Ivel Cup

Sunday Afternoon, May 26th.
EXHIBITION AND PASSENGER FLIGHTS by GRAHAME-WHITE and Competitors.

Whit Monday, May 27th, at 12 noon.

12 noon to 2 p.m. EXHIBITION FLIGHTS by GRAHAME-WHITE and Competitors.
2 p.m. Event 1. RELAY RACE. £60 Prizes.
3 p.m. Event 2. PASSENGER-CARRYING SPEED HANDICAP for Cup and 25 sovs. (2nd 10 sovs.).
4 p.m. Event 3. CROSS-COUNTRY HANDICAP, about 45 miles, for the GEISLER Challenge Trophy and 100 Guineas Cash (2nd 25 sovs., 3rd 10 sovs.).
5.15 p.m. Event 4. GRAND SPEED HANDICAP, open to all types, for Cup and 30 sovs. (2nd 15 sovs., 3rd 5 sovs.).
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THIS WEEK. SAT., MAY 18th, At 3.30 p.m.

SUMMER MEETING.

1. CROSS-COUNTRY HANDICAP.
2. GRAND SPEED HANDICAP.
3. ALTITUDE CONTEST.

Saturday, June 1st, June Meeting.
Saturday, June 8th. **First Aerial Derby** ("Daily Mail" Trophy).
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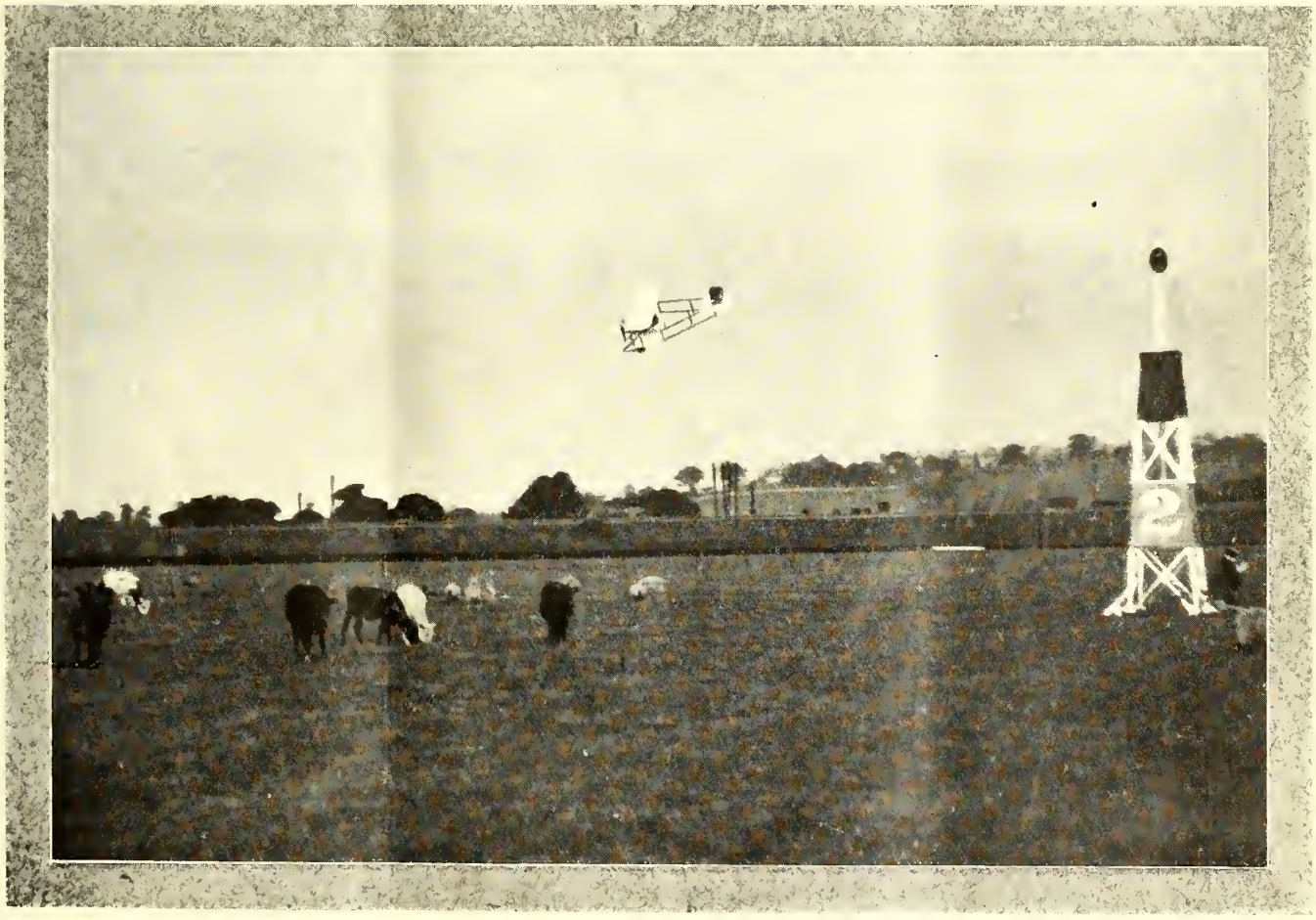
THE AEROPLANE

Edited by CHAS. G. GREY. ("Aero-Amateur")

1D WEEKLY

VOL. II. [Registered at the G.P.O. as a Newspaper.] THURSDAY, MAY 23, 1912. No. 51.

RURAL SIMPLICITY.



Away from the crowd, on the far side of the London Aerodrome, one finds a scene of rural simplicity. In the background are the fields of Hendon Hill; in the middle distance the railway, with its occasional trains to wake the cattle and sheep placidly grazing in the foreground; while overhead Mr. Ewen on the Caudron performs wonderful evolutions and disturbs the little birds.

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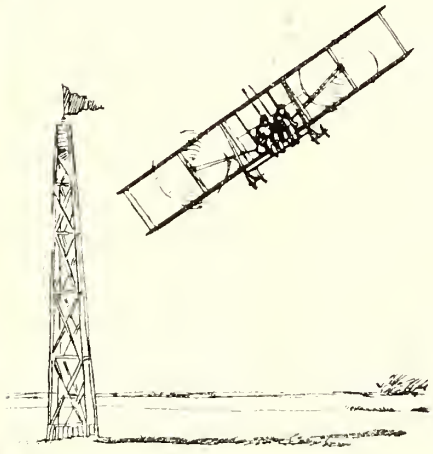

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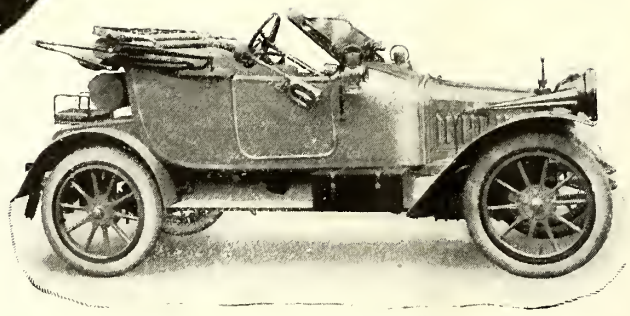

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MATTERS OF MOMENT.

COMMANDS IN THE ROYAL FLYING CORPS.

The officers who are to command the chief sections of the Royal Flying Corps being now appointed, it is perhaps permissible to comment on them. One gathers that it has from the beginning been intended to give a sailor the command of the Central School, and so the appointment of Captain Godfrey Paine, R.N., M.V.O., was more or less to be expected. He is a thoroughly efficient officer, and is not only popular with his subordinates, but is respected by them. It is true that the promise was made that commands would only be given to "expert fliers," and one can scarcely regard an officer who has only just taken his certificate as an "expert." But, in fact, the promise itself was more than a little of a mistake, for a man may be eminently fitted for command and at the same time a very bad flier, while on the other hand a magnificent flier would very probably be a hopeless failure as a commanding officer, for in all but a very few cases the better the flier the less he knows about aviation, and a very clever flier might quite excusably make the grave error of expecting all his subordinates to do everything he could do himself, with disastrous results.

It is certainly somewhat subversive of old ideas that a sailor should be in command of land forces. Sailors ashore work well under soldiers, and soldiers afloat has always done well under naval commanders, because both are out of their own element, and recognise the fact. Still, one must remember that in the relief of the Legations at Pekin, Admiral Sir Edward Seymour commanded a mixed naval and military force with conspicuous success, and that in 1871, an Admiral of the French Navy commanded a division with distinction, so the appointment has good precedents. *A propos* of this, naval and military aviation is likely to call for a certain number of engineer officers, not necessarily as pilots, and it is to be hoped that naval engineers will be given a fair chance under the new *régime*, for one is reminded that in the Boxer Rising, which led to the taking of the Taku Forts, the siege of Tientsin, and the relief of the Legations, the only commissioned officers of the British Navy who took part in the land operations and did not receive special promotion were the engineer-lieutenants, and this despite the fact that on them very largely depended the running of the railways which supplied ammunition and food to the whole force.

The appointment of Lieutenant (Acting Commander) C. R. Samson, R.N., to be Commandant of the Naval Wing was also expected. Commander Samson has worked for the position and reaped his reward. He is an excellent leader of men and a smart officer. One's only possible doubt is one which would exist equally in the case of any other officer who was a flier of the same calibre, namely, that, being so fine a pilot, and so fond of flying for flying's sake, he might want to do all the flying himself, though naturally his own good sense will put an effective check on any such tendency.

Captain F. H. Sykes' appointment to be Commandant of the Military Wing has already been noted, and the best earnest of his success is the approval with which his appointment has been received by those who know him best. Naturally there are likely to be some misgivings on the part of regimental officers over the appointment of an officer from the General Staff to an administrative command, but there always has been and always will be a certain amount of mutual mistrust between individuals of the two sections till a member of either has proved his ability to the other, and Captain Sykes may be depended upon as the right man in the right place.

The mental attitude of the regimental officer to the staff officer may be illustrated by the absolutely authentic story of a General Officer, who, in the course of a worrying field day, called the colonel commanding a battalion a damned fool, and afterwards thought better of it and apologised. The colonel's reply was, "I don't mind your calling me a damned fool, sir, but I do object to being called a damned fool before the damned fools of your staff, sir." Of course, it is quite a mistaken attitude, but it does exist, and Captain Sykes is just the man to remove it, so far as his particular section of the Army is concerned.

The appointment of Lieutenant-Colonel H. R. Cooke, R.G.A., to the staff of the Central School as an instructor has also been made, and one may assume that he will be senior officer of the Military Wing at the school itself. Colonel Cooke has only recently returned from India, where he has been in command of a mountain battery. He has not flown since he took his certificate on a Blériot at Beaulieu early in 1911—except for any flying he may have done at Farnborough during the past week or two—but there are few, if any, officers in either Service who know as much about the science of aviation as he does, and he is just the man to organise and run his part of the school as it should be run. He is what one may best describe as a "sound" man.

Captain Broke-Smith, R.E., has also been appointed as an instructor at the School, presumably to deal with the supplementary subjects.

At the time of writing other appointments have not been gazetted, but the two men whose services

stand out for recognition are Major Sir Alexander Bannerman, R.E., and Captain Fulton, R.F.A.

The one has had his work hampered by pseudo-scientific civilians, who have, to put it colloquially, "messed up" the Army dirigible section by trying experiments, interesting and amusing to themselves, while they might, with the vast sums of money at their disposal, very well have provided at least one really respectable dirigible for the training of Army men, more especially as they had the whole power-plant of the *Clément-Bayard* ready to hand, and only needed to construct a sound envelope, and a decently designed car arrangement, which, however, one fears, judging by the collapse of the still non-apparent *Delta*, may have been too big a task. However, Major Sir Alexander Bannerman, Captain Maitland, and Lieuts. Waterlow and Fox deserve recognition for their efforts to do real dirigible work with toy balloons.

Similarly the Aeroplane Company on Salisbury Plain has been hampered by having to work with inefficient machines, until quite lately. Captain Fulton, one of the finest fliers in this country, has dutifully refrained from doing more than a few flights himself, though in the last of these, in which he took the R.Ae.C. superior brevêt, he showed that he was as capable as ever. He has devoted himself to administrative work, with the result that the aeroplane establishment on Salisbury Plain, in *personnel* and *moral*, and even in *matériel* (considering the stuff available), is a model for any army in the world. The officers who have worked with him, Captain Burke, and Lieutenants Conner, Barrington-Kennett, Hynes, and Reynolds, are magnificent fliers, as their cross-country performances show, and they are all efficient officers, not merely pilots.

These are the men to whom rewards are due. Many other officers, among them some who are great fliers, and others who will advance the work of the dirigibles, are now joining the Royal Flying Corps. They also will distinguish themselves in time, but although England is notably the country most ungrateful to its servants, the pioneers of Salisbury Plain and Farnborough, together with Lieuts. Gregory and Longmore, R.N., and Captain Gerrard, R.M.L.I., the nucleus of the Naval Wing, must have their services recognised now that the special selections have been made for the highest posts.

Practical Education in Aviation.

The students of the International Correspondence Schools, numbering 65,000 in Great Britain and 160,000 in the British Empire, are about to receive very practical educational demonstrations of the importance of aviation from a national, and, indeed, from an international, point of view. A comprehensive programme has been arranged, of which one of the principal features is that on June 15th a great I.C.S. aviation meeting will be held at the Hendon Aerodrome.

In July, 1910, the schools offered a prize of £100 to the first graduate of the I.C.S. aviation course who successfully flew a mile over British territory. This prize is to be competed for at Hendon, on June 15th, by J. H. James and H. H. James, two brothers from Cardiff. The contest will be made under the auspices of the Royal Aero Club, with whom the prize has been deposited.

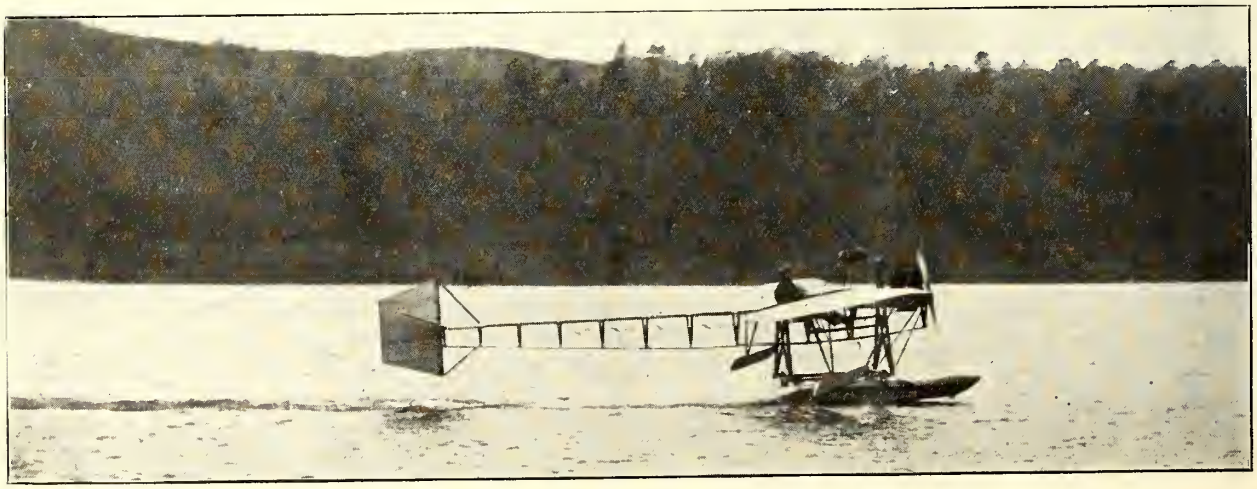
The great event of the afternoon, however, will be the departure of Mr. Robert Slack, a student of the schools, for an aerial circuit of England, Scotland, and Wales. The total length of the projected flight is 1,100 miles, and will include Leicester, Nottingham, Sheffield, Leeds, Newcastle, Edinburgh, Glasgow, Blackburn, Manchester, Liverpool, Birmingham, Cardiff, Bristol, and so back to London.

Mr. Slack is a native of Nottingham, and an engineering student with the schools. In the autumn of last year he won his pilot's certificate on a Blériot monoplane at Hendon. Since that time he has been engaged at the Blériot School.

In the interest of technical education the schools have retained his services. They have bought a Blériot monoplane of the latest type, and on this he is to visit the most important of the schools' local offices. At each centre Mr. Slack will give demonstration flights before gatherings of local students, to which, moreover, admission for the general public will be arranged.

In every town and district of Great Britain there is a branch of the International Students' Association. The objects of this association are social and educational. The students own a clubroom in each town, where they study, read papers on technical subjects, hold debates and social gatherings. In each town that he alights, Mr. Slack will also lecture before the students on aviation from a practical and national standpoint. He will illustrate his lecture by lantern slides, showing the different makes of machines, etc., and the most recent progress made in the science of aviation. The tour will occupy from three weeks to a month.

Mr. Slack's "Circuit of Britain" and his flying demonstrations and lectures will certainly have great educational effect. They will demonstrate the importance of flying, and can scarcely fail to rouse patriotic feelings. This consideration has suggested that there could not be a more fitting termination to Student Slack's flight than that his aeroplane should be presented by I.C.S. students to the nation. A scheme by which all students may participate in this presentation is now being arranged, and it is to be hoped that it will meet with enthusiastic support.



Mr. Ronald Kemp on the Gnosspelius hydro-monoplane on Windermere. Note the shape and position of the float.

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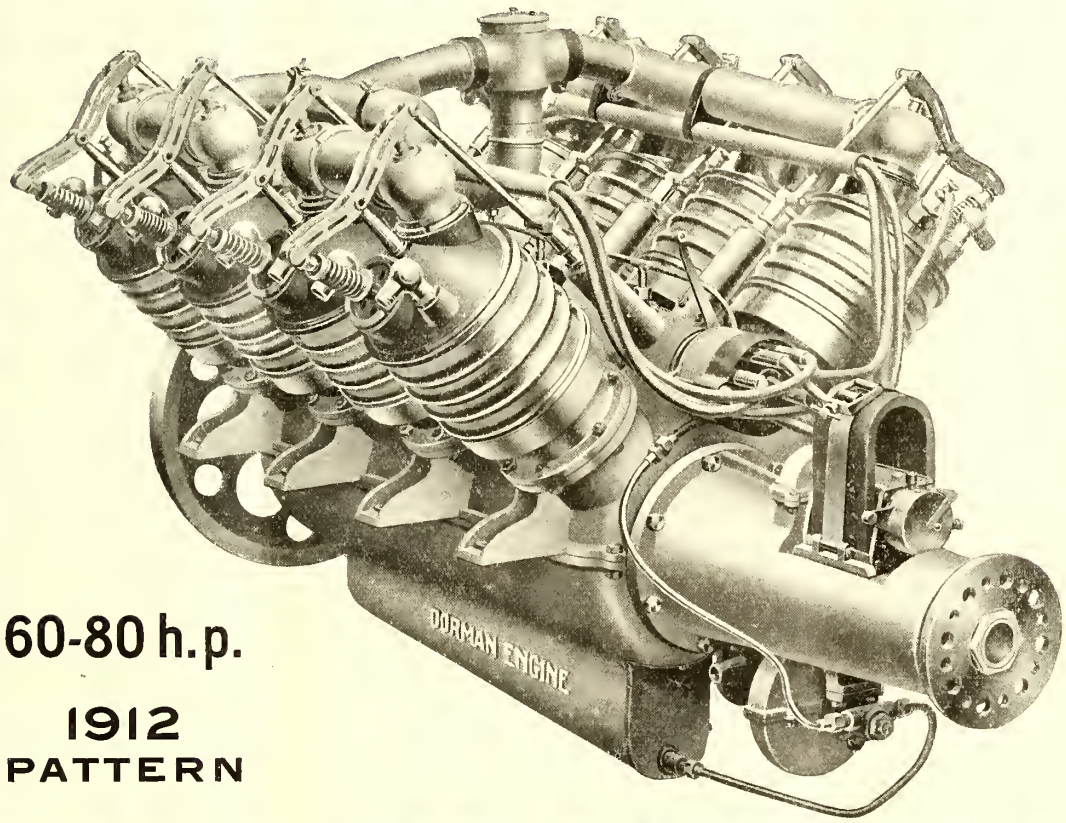

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Observation—*(continued).*

BY W. E. de B. WHITTAKER.

To return for a moment to the question of pilot and observer or pilot-observer, it is perhaps well to quote a paragraph from the "Report of the Chamber of Deputies Budget Commission upon the Aeronautical Section, French Budget, 1912," published December, 1911, and translated in *Army Review*, April, 1912, as some proof of the view held in official circles in France. "The pilot alone, from a military point of view, is almost nothing; he is an air courier, merely useful in the same way as a postman. But the pilot and observer together are, perhaps, an element of victory for the staff." This can hardly be quoted in support of General Henderson's views.

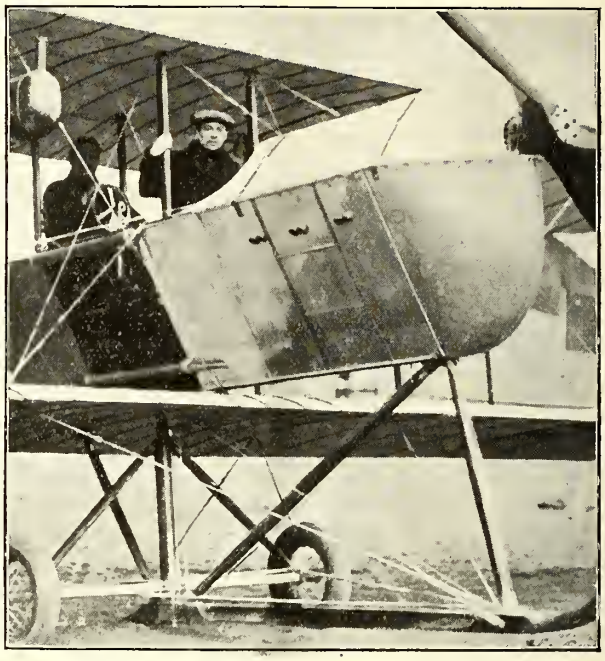
The training of observers now becomes an important part of Army work. When it is realised how many mistakes can be made in the reading of objects which are seen under everyday conditions it will also be realised how many more will be the mistakes made in the determination of objects seen from a totally unaccustomed point of view. Steeplejacks, it is true, have daily experience in the contemplation of things from above, but neither the supply nor the military training of such is adequate for Army purposes.

Aerial observation cannot be acquired by the ardent study of tactical treatises nor by the perambulation of aerodromes. Constant practice over broken country, on which troops are engaged if possible, is quite essential. It is not abstract theory that teaches us the bird's-eye view of life, but the intelligent use of many hours in the air. This subject is dealt with excellently in the above-mentioned Report. I quote again: "The best of staff officers cannot turn himself into an observer in a moment. During the first ascent he will be completely useless; the bravest are temporarily overpowered by giddiness owing to height, the roar of the motor, of the propeller, and of the wind. When all sense of discomfort has gone, the attention must be fixed on objects which pass all too rapidly before the eyes, and the observer must direct himself by the specially prepared map on which can be read at a glance the country over which he is flying. Experience alone allows one to recognise country from an aeroplane, and to grasp, for instance, that the object which looks like a grey crawling worm is a company of infantry in column. The observer must train his eyes and be able, if necessary, to supplement their shortcomings by photography. It will be seen, therefore, that much practice by the observer and pilot in collaboration is necessary."

Personal Experience.

It is curious what extraordinary shapes each little thing of the common day takes when viewed from above. Slate roofs slightly wet become ponds, patches of raw earth develop into anything the fantastic imagination likes to make them, bracken becomes a forest, and so on. To mention a personal experience. Many months ago I was flying as a passenger on a biplane at an altitude of about two thousand feet over open country. The ground below, broken up by dykes, was dotted with tiny white patches by no means minutely uniform in size. Both my pilot and myself read these objects as stones, and condoled in thought with the landowner on the rockiness of his possessions. The white patches were really sheep.

The determination of numbers from above is not easy. A battalion broken up into some resemblance to brigade formation may easily deceive any but the most expert observers. Troops in column are the easiest to read and count. Extended order adds to the difficulty of calculation proportionately. From an aeroplane an army on the march or holding a position is not the open book the majority of aviation enthusiasts would have us believe. Whole brigades can be hidden much more easily than would be imagined. Obviously in heavily wooded country invisibility from above is easily obtained, but in open country, if infantry sit down by the road-



The observer's position on the Astra biplane.

side or by hedges and ditches, or even, as a last resort, irregularly on open ground, the aerial observer is puzzled. He knows that there are troops below him, but of their numbers he is completely ignorant.

Guns, again, by painting them to resemble the ground, can be rendered almost invisible from above. The method referred to by Colonel H. C. L. Holden, R.E., at a recent lecture, of turning up fresh ground to resemble the bird's-eye view of a gun works in one direction only, that is to give the appearance of strength. Invisibility is of equal, if not of greater, importance. Instances of confusion could be multiplied to almost any degree, but as it is a matter within the experience of any pilot who has risen to a sufficient height over strange country, further examples are unnecessary. At low altitudes most things are clearly visible, but it must be remembered that the mean height used in reconnaissance will increase rather than decrease. The accuracy and range of modern artillery, even when the guns are British and the gunners Cockney, must never be under-estimated or forgotten. We shall not know how accurate they are against the aeroplane in flight until actual war gives us the experience. The suggestion that civilian aviators should be employed as targets for the scientific artilleryman should be treated with the contempt it deserves.

Efficiency and Vision.

The type of machine and the range of vision are, at the moment, problems of deep interest. Questions of aerodynamic efficiency regulate to some extent the position of pilot and observer and reducing the range of vision. Obviously under present conditions the angle of view decreases as aerodynamic efficiency rises. I am advised that this decrease is really quite unnecessary, and an aeroplane of the highest efficiency could be designed in which the view is practically unrestricted. The value of such an aeroplane to the Army does not need demonstration.

The most useful view to a military observer is that in front and below him. The view behind is not of such importance. If sufficiently high it ought to be possible to make sufficient notes before the object passes behind the field of vision. Then there is always the return journey to be remembered. On the way back the notes

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could be supplemented and altered as desired. A clear view is more important on a single-seater than on an observer-carrying machine, as in the former the pilot has to make observations in addition to retaining perfect control over his aeroplane. An observer, relieved from the necessity of piloting the aeroplane, can move about comparatively freely in order to obtain the best view possible.

Supreme among scouting machines so far as breadth of freedom of view is concerned is the Demoiselle. Yet the flying idiosyncrasies of that machine are such that one doubts if there would be any rush of applicants to fly the type. Almost similar as to view are the Autoplan (de Pischoff), the Blériot type XII, the Ponche et Primard, and the Grade, but strong objections exist against them all, and it does not seem possible that we shall have examples of them added to the British aerial fleet. Generally speaking, the biplane presents a better angle of view than the monoplane, though the introduction of transparent panels in the wings of the latter increases its value as a scouting machine.

A machine from which the observer has a very great, useful angle of view, according to Captain Pichot-Duclos, is the Astra tractor biplane, where the passenger is seated just in advance of the lower plane and behind the engine. Another biplane with similar angle of view —larger, if anything—is the modern non-lifting-tail Farman, on which the pilot and observer are placed in advance of the lower main plane on a ladder-like structure. There is little to choose between either aeroplane on the score of observation; they differ only in the degree of flying efficiency. In the Astra biplane it is probable that the pilot and passenger are safer in the case of a smash than they would be on the other type. I have insufficient data to say which is the better from the purely aerodynamic point of view, and mere prejudice ought to find no place in academic discussion.

The latest Blériot tandem two-seater stands almost alone among efficient monoplanes for the extensive field of view it possesses. The pilot's seat is roughly over the centre of pressure, well forward in relation to the rear edge of the wings. The passenger's seat, on the other hand, is well behind the trailing edge of the wings. He can see forward some distance, and his view to the sides and back is unrestricted. Unfortunately the very portion of the view which is intercepted by the wings is of considerable value to a soldier. Even with this slight objection it combines aerodynamic and military efficiency to a degree possessed by no other machine.

I have referred to no British machines that one may avoid personalities. There are several aeroplanes built in this country of high efficiency, and yet of great suitability for scouting purposes.

The Military Aeroplane Competition, 1912.

The final regulations, revised conditions, and method of entry for the official aeroplane competition have at last been published. As was pointed out in these pages some months ago, certain clauses of the specification of a military aeroplane as laid down in the preliminary statement have been altered in consequence of the legitimate criticisms desired by the framers of the regulations. Despite the strangely held opinions of certain irresponsible journalists, the Government have really a desire to assist the aeroplane manufacturer, and to acquire aeroplanes capable of carrying out to the best advantage the duties required of them by the military authorities. The more rigid the conditions the better the results.

The alterations are less in number and form than one would at first imagine. To quote (M.A.C. Form C, p. 1, par 3): "An aeroplane will not necessarily be disqualified for failing to comply with the conditions required to be fulfilled by a military aeroplane (M.A.C. Form A.), but these conditions, as modified by paragraph 6 of this paper, and the 'desirable attributes' mentioned in paragraph 14 of the 'Specifications for a Military Aeroplane' (M.A.C. Form B) will form the main basis on which the Judges' Committee will decide the relative merits of the competing machines."

Paragraph 6 in the new conditions is as follows:—

"Preliminary Tests.—Before permitting any machine to proceed further with the competition, the Judges' Committee will make a preliminary decision based upon the conditions contained in paragraphs (2), (3), (4), and (9) of the 'Specification for a Military Aeroplane' (M.A.C. Form B). For this purpose these conditions shall be modified to read as follows:—

"The aeroplane should satisfactorily and without being damaged in any important part in alighting or otherwise—

"(*a*) Carry a live load of 350 lbs. in addition to its equipment of instruments, etc., with fuel and oil for 4½ hours.

"(*b*) Provide accommodation for a flyer and observer, and the controls should be capable of use by either flier or observer.

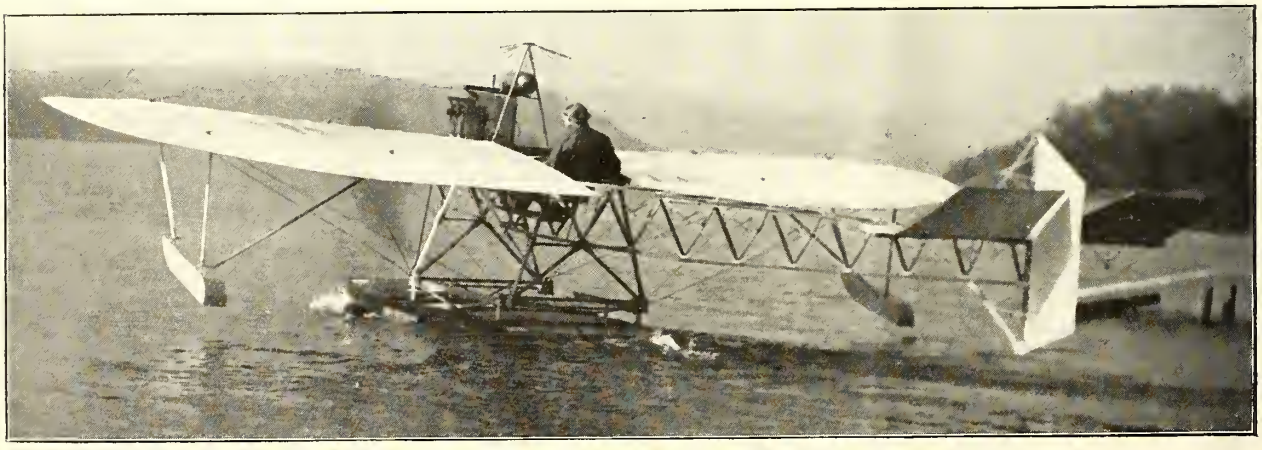
"(*c*) Fly for three hours loaded as in Clause (*a*) and attain an altitude of 4,500 ft. Maintain a height of at least 1,500 ft. for one hour.

"(*d*) The rate of climbing shall average not less than 200 ft. a minute for the first 1,000 ft.

"(*e*) Attain an air speed of not less than 55 m.p.h. loaded as in Clause (*a*).

"Competitors will notify the Judges' Committee when they intend to demonstrate their compliance with (*c*), (*d*), and (*e*), stating in writing which test is contemplated. A reasonable period, based on the amount of suitable weather for flying experienced, will be allowed by the Judges' Committee for carrying out these tests. The Judges' Committee will display a signal at all times when, in their opinion, the weather is suitable for flying, but competitors will be in no way bound to fly in, or confine their flying to, hours so notified as 'suitable.'"

It will be noticed that the new regulations ordain that competitors shall fly for one hour at a height of 1,500 ft. and not at 4,500 ft. for one hour as previously required. Aeroplanes must, however, rise once to a minimum attitude of 4,500 ft. This change is due presumably to the disinclination



Mr. Kemp on the Gnosspelius hydro-monoplane, showing details of floats.

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of certain pilots to fly at the greater height for any length of time.

The official Committee reserve to themselves entire freedom of action in the selection of the winning aeroplane and can eliminate any pilot or any machine at any stage of the competition without giving reasons. Further tests can be insisted on if required.

The Military Aeroplane Competition will, so far as one can judge, be of great use in the selection of machines suitable for military purposes. The conditions appear to be excellent, and if the rewards are not so profuse as the manufacturer would naturally wish, it is well to remember that entrants are competing for business and not for prizes.—W. E. de B. W.

French Military Aviation.

The conditions regulating the "brevet militaire" are as follows, from May 1, 1912, onwards:—

"The candidates make—

"(1) A flight from point to point over a minimum distance of 150 kilometres without making an intermediary descent. The return journey must be made on the same day, or on another day on which similar conditions prevail.

"(2) A triangular flight of at least 200 kilometres in two consecutive journeys on the same aeroplane, with two obligatory descents at points announced previous to the flight.

"In the course of the two flights regulated by paragraph 1 each candidate is expected to maintain an altitude of at least 800 metres during a period of at least a third of the two journeys."

Captain-Aviator Paul Echeman was killed on May 14th at the Villesauvage Aerodrome, near Etampes. After flying for about ten minutes at an altitude of 150 ft., he fell to the ground from some unexplained cause. He was terribly injured, and died in hospital after two hours.

Lieutenant-Aviator Van den Vaero, commanding the aviation detachment at Casablanca, flew, on May 14th, round the French battleship *Jules Ferry* to welcome General Lyautey, who had just arrived to take command of the French forces in Morocco.—W. E. de B. W.

The King and Queen at Farnborough.

The Army aviators certainly made an excellent display before the King and Queen, during the Royal Visit to Aldershot, and, despite adverse weather, must have convinced their Majesties that the Army is in no way behind the Navy in flying ability.

On Wednesday, the 15th, the King and Queen visited Farnborough, as was duly noted in the daily Press. They saw some man-lifting kite operations, which were moderately successful, and inspected various aeroplanes, but the weather was too bad for flying. However, a few minutes after Their Majesties had gone, four aviators turned out, and notwithstanding the wind did some good flying. These were Lieut. Fox, R.E., on *B.E.3.* biplane, Captain Burke on *B.E.1.*, Mr. de Havilland on *B.E.2.*, and Lieut. Barrington-Kennett on the Nieuport.

On Friday afternoon Their Majesties again visited Farnborough, by motor, and inspected the Royal Aircraft Factory.

After making the tour of the Factory Their Majesties held a review of the Aeroplanes on Farnborough Common, eight machines being there. Five of them afterwards went up. Captain Burke on *B.E.1.*, Mr. de Havilland on *B.E.2.*, Lieut. Fox. R.E., on *B.E.3.*, Captain Loraine on the Deperdussin, and Lieut. Barrington-Kennett on the Nieuport, all flying at once.

After several of the aviators had been presented to the King, who was much interested in the flying, he and the Queen left for Aldershot.

In the evening nearly all the machines were up again. Mr. de Havilland on *B.E.2.*, Lieut. Fox, R.E., on *B.E.3.*, Captain Burke on *B.E.1.*, Lieut. Conner on the Bristol biplane, Lieut. Barrington-Kennett on the Nieuport, Captain Loraine on the Deperdussin, and Lieut. Reynolds on the Avro biplane, all put up a great deal of fine flying till dusk. Mr. Cody was also flying well on his biplane.

One could not help noticing that the Avro biplane, which had, by all accounts, beaten even the splendid *B.E.* machines of Mr. de Havilland's design in speed and climbing power, was not flown before their Majesties, the exhibition being confined to foreign machines and the Factory's own products. One would have rather expected that, as the Factory officials have so often expressed their desire to assist British manufacturers, a special effort would have been made to have had some machines other than those built by the Factory to fly before the King and Queen. Still, after all, the Royal Visit was primarily to the Royal Aircraft Factory, so it was only fit and proper that all the Factory's own machines should be shown to the best advantage.

The Aeronautical Society.

At a special general meeting on Thursday, May 16th, the chairman of the Council, Major-General R. M. Ruck, said that the object of the meeting was to amend the rules so that associate members should pay one guinea subscription and be admitted without entrance fee, the idea being to obtain an increased revenue to the society.

He reminded his audience that the present membership subscription was two guineas, with an entrance fee of one guinea, which amount, although fair for those actively interested in the society's work, did, without doubt, prevent support from those in more distant parts of the country.

Under the present rules the Council has power to elect associate members, who have most of the privileges of full membership, but no power to vote or hold office. At present the subscription to this grade is only half-a-guinea, a sum that does not repay the society for the expenses incurred.

It is not anticipated that the new proposal will adversely affect the revenue from full membership, for all who want to play any part in the control of the society must so join, because the associate membership grade carries with it no vote. On the other hand, the associate membership section should make a strong appeal.

The meetings of this session have been very successful in the excellence of the papers and in the interest they have evoked outside the immediate bounds of the society, the latter aspect of the situation being one of the most encouraging of all. But this work costs money, and the Council sees only one sure policy of progress, which is to make the society self-supporting from the revenue of its membership.

The Council is about to publish a small book giving a brief account of the Aeronautical Society and outlining the history of the development of aeronautics since the eighteenth century. The cost of preparing this work has been considerable, notwithstanding the fact that it was written gratuitously and is being printed without profit, so the Council hopes that every member will not only buy a copy for himself, but will buy three or four extra copies (the price will be 1s. each) to send to friends who might be induced to join.

The Council already have in preparation for next session an excellent programme, and is considering the arrangement for a series of popular lectures, explaining the why and wherefore of various everyday things in aeronautics to those of the public who have only just begun to take an nterest in the subject.

The chairman regretted to have to announce that Mr. Hubbard was resigning his secretaryship, and said that Mr. Hubbard's work for the society had been a labour of love, for the salary that the society had been able to give had hardly warranted removing the term "honorary" from his title. It would be necessary to find a new secretary as quickly as possible, and the Council would be glad to be informed of anyone willing to devote his time to this work.

Continental Notes.

Beginning on July 12th, there was a small aviation meeting at Orleans. M. Gougenheim and Lieutenant Kamberos on H. Farman biplanes (new type) and M. Verrier on a M. Farman biplane fitted with the Doutre stabiliser. Two days later Molla made several excellent flights on a R.E.P. monoplane. These little meetings do a great deal towards popularising aviation, and, if properly managed, they are not without profit.

Chambenois has of late been flying the Borel hydro-aeroplane at Bougival, and, so far as one hears, with considerable success.

M. René Simon, who is in the first rank of Blériot pilots, has just purchased a Sommer monoplane, type E.

Thirty-six aeroplanes have been entered for the Grand Prix of the Aero Club de France, which takes place on June 16th and 17th this year in Anjou. During the two days seven circuits of the course will be made, amounting in all to 1,102 kilometres. The entries are as follows:—Five Morane Saulnier, five Deperdussin, three R.E.P., three Sommer, two Hanriot, two Bréguet, one Caudron, two Astra, one Zodiac, three Nieuport, two M. Farman, one H. Farman, one Paul Zeus, three Blériot, one Ladougue, and one Borel.

Vidart, on a 50 h.p. Deperdussin, is the only pilot who has, so far, flown over the Circuit d'Anjou in practice.

A New School Move.

The development of the Deperdussin firm includes the establishment of a school at Hendon as well as at Brooklands. Mr. Sabelli, who is one of the very best fliers in this country, is to have charge of the Hendon school, and he will be a great acquisition to the number of fine fliers already at Hendon. Mr. Gill, an ex-pupil of the Deperdussin School, will take charge at Brooklands.

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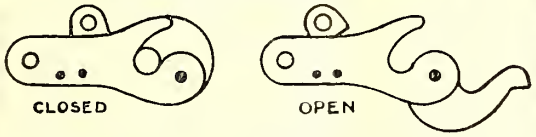

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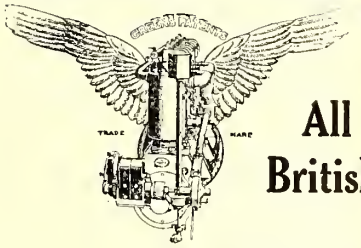

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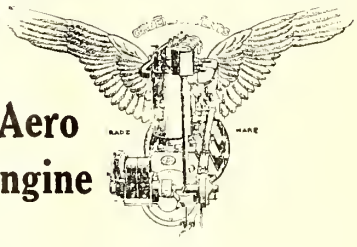

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The Funeral of E. V. B. Fisher.

On Thursday morning last, E. V. Beauchamp Fisher was buried in the little cemetery at Weybridge. His was a simple little funeral, suiting the simple way he lived. Only his near friends from Brooklands came to pay their last respect to one of their own kind.

These are the men who work all the hours that God sends, who, because of their work, do not appear on show days arrayed as young men of fashion, and are accordingly despised by superior persons as "shed-loungers" and "mere mechanics," but who are in truth the men who have made British aviation what it is, in spite of neglect from those who should have supported them. While the men with money have spent it on buying foreign machines and paying foreign mechanics to look after them in this country, Fisher and his like have spent their all, their small private incomes, their poor little savings, on their work in their own country, and they have turned out machines, mechanics, and pilots equal to the world's best.

These were the men who came to lay one of themselves to his last rest. Fisher is no more; many of the others will live to see the industry on whose foundation they have expended the energy of their youth become one of the great industries of the nation, to the glorification of city financiers, and the profit of many who will never know the pains through which they have passed in bringing it into being.

To those of us who have been in the thing from the beginning there will always remain the one thing denied to the late-comers, the simple phrase, "Do you remember?" And when the old memories are recalled, one of the most precious of them will be our friend Fisher.

The pathos of the little funeral was made more poignant by the presence of the brave old father, Major Fisher, erect and soldierly, despite his eighty-five years, now in his great age left childless, and alone, but for one brother, almost as old, who stood by him at the grave-side.

Beyond those of us who knew Fisher best there were few from outside Brooklands. His uncle and aunt, Sir Edward Beauchamp, M.P., and Lady Beauchamp, were there; another uncle, the Reverend H. Beauchamp, who conducted the service; one or two cousins of the same family; Mr. and Mrs. Thomas Maryon-Wilson, who may almost be reckoned as belonging to Brooklands; Mr. Fred May; and Mr. George England, of Haywards Heath, were almost the only others present.

At the inquest on Wednesday it was clearly established that the accident was in no way due to any defect in the machine, nor was it caused by any physical deficiency in the pilot, medical evidence showing that the arm which he had injured some weeks before, was uninjured by the fall. The strap he was wearing gave full play to that arm and merely prevented him from raising it over his head, though the doctor had told him on the previous Friday that he could leave it off.

One can only assume, then, that in the dive following the side-slip poor Fisher must have been thrown out of his seat on to the control bar, so holding the elevator down, and was unable to force himself back into his seat in time to get the machine back before she struck. At 30 ft. or 40 ft. up it would not have mattered much. At 3,000 ft. he might have had time to get back. As usual, 100 ft. to 200 ft. proved the danger zone.

Information received after the account given last week was published, shows that the fire did not burst out fully till after Mr. Sopwith had dragged the body of the American, Mason, from under the machine, so that he was not badly burnt. At first the fire was confined to the part round the engine, the petrol running out from holes where the pipes had been torn out of the tank, and the tank itself did not burst till some minutes later.

The machine was, of course, broken everywhere, though it more or less retained its shape after the fall, and it has now been absolutely destroyed by Mr. Flanders' orders.—C. G. G.

Some School Impressions of E. V. B. Fisher.

He came to us at Tonbridge School a frail, rather sickly-looking, lanky, hollow-eyed lad of thirteen. He had medical exemption from football, and we were to be specially careful of his health. I have his portrait before me in house-groups of 1902, 1903, and 1904, showing his progress outwardly from strength to strength; and there lies, too, beside me as I write a photograph of him in 1912, as he sits in his Flanders monoplane, wearing the Old Tonbridgian muffler, without which, I think, he never flew.

He was weak and timid at first, and yet——. Well, one day in the winter of 1902 a parcel came for him. "Do you know what this contains?" I asked him. "Yes, sir; some sweets from my mother," was the reply. A few hours later I received a telegram asking me to break to the boy the news of the sudden death of his mother that very day. I told him somehow; and the weak, timid lad bore himself like a strong, bold man, and went off alone that evening to comfort his widowed father.

One Sunday morning after chapel I heard one of his friends exclaim: "I say! Fisher's got three thousand volts." With horror in my soul I hurried to his study; but there was no need for alarm. He was busily working a Wimshurst machine, bought with much saving of his pocket-money: "The air is a bit thick in here, sir," said he, "and I am just making some ozone."

You could see by the shape of the boy's fingers, and by a certain deft hovering way he had of using them, that he was a born mechanician. A disappearing target was wanted on the School miniature safety range, and the circumstances and arrangements being peculiar, no known pattern or system would serve. So a prize of a pound was offered to the boy who would send in the best plans, etc., of an invention to suit the case. Young Fisher, who was very keen on the Cadet Corps and an excellent marksman for his age (I have often seen him since at Bisley), sent in drawings and designs that won the sovereign hands down. He was a clever fellow, and was in the Engineering VI Form when, at the age of not quite seventeen, he passed out of Tonbridge into the wider world of Mechanics in London.

His gentle disposition, his heart as true as steel, his enthusiasm for things new (he was the first man to show me Radium), his tenacity of purpose, his courage in opinion, will live in the memory of those who knew him best.

The four years of his life at Tonbridge were an early chapter in the, alas! brief history of the making of an aviator: and now the book is closed. He has passed away, like other young pioneers of this new age, meteors of renown, yesterday unknown, famous to-day, to-morrow sped beyond the veil. Yet their yesterday abides in some minds, even as Edward Victor Beauchamp Fisher's school days bequeath memories of his young life. Life! The lesson taught by fallen tower in Siloam, by devastated Messina, by drowned *Titanic*, by shattered aeroplane; aye, and by prodigal waste of springtide blossom, the lesson which Chavez gave, when his soul winged its flight from Domodossola, is the old one which poor Fisher's fate bids us learn anew—'tis only life that counts.—E. C. G.

Major Robert Fisher desires to thank all kind friends who sent wreaths to the funeral and letters of sympathy to himself on the death of his son, Mr. E. V. B. Fisher, at Brooklands on the 13th inst.

A Strange Accident.

Mr. Jack England, writing from La Raiz, Argentina, encloses a cutting from a Mendoza paper, which reads thus:—"On Sunday M. Paillette, the French aviator, who has been exhibiting his skill in this neighbourhood for several weeks now, met with his first accident. Whilst manœuvring at a very low altitude, the motor of his machine suddenly stopped, and the aeroplane rapidly fell. The right plane caught in a tree in the Park, and the other side came into sharp contact with mother earth, resulting in one or two slight breakages, which have since been repaired. A large number of people were in the Park, and volunteers from the crowd of spectators speedily lowered the machine. Fortunately M. Paillette himself escaped injury. M. Paillette will shortly proceed to Chili and give displays with his aeroplane at Valparaiso and Santiago."

Writing on March 31st, Mr. England sends a translation from *La Nacion* as follows:—"Mendoza, March 30th. The first flight as a political advertisement in the Argentine. Paillette flew for one hour over Mendoza, Godoy Cruz, Luján, Maipu, Gutiérrez, Las Heras, and Guaymallén, taking this placard, 'Vote for Benegas, who is the popular candidate for the Nacional Deputy in the Assemblies on April 7th,' also throwing out pamphlets with the same inscription. This has caused much surprise."

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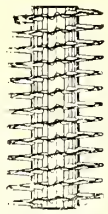

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The Hendon Summer Meeting.

For once, on Saturday last, Hendon was granted a fine afternoon for one of its meetings. As the weather improved from midday onwards, the crowd got larger and larger, till by tea-time there must have been a good many thousands of people present.

The cross-country race was deprived of a good deal of its interest by the fact that Mr. Valentine's Gnôme had gone wrong, and so the Bristol could not start, and Mr. Moorhouse was also suffering from engine troubles. Consequently only Mr. Lewis Turner and Mr. Hucks started, the former scoring a runaway win owing to the handicappers having apparently forgotten that the Howard-Wright biplane is many miles per hour faster than the average Farman type machine.

In the speed handicap Mr. Valentine got his machine going, but broke a valve-rod after rolling a few yards, so Mr. Hucks flew alone, and in the next heat the handicappers again gave the Howard-Wright a runaway win from Mr. Ewen's little Caudron biplane, though the latter flew magnificently and fetched back several laps. His banking at the corners was particularly striking.

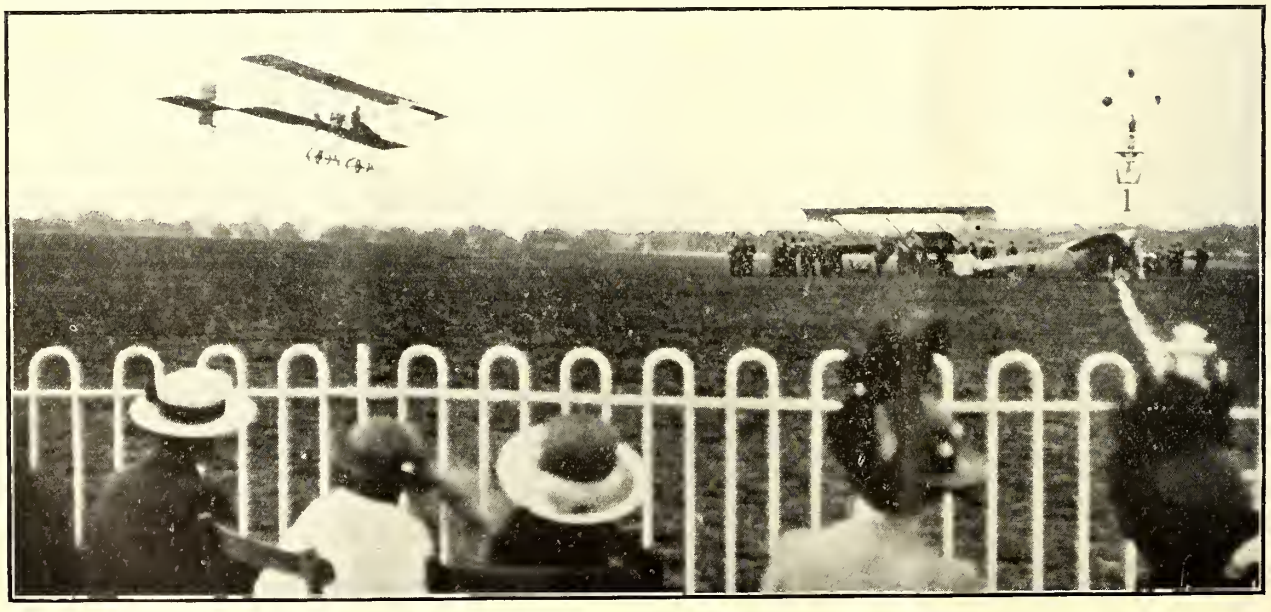
Unfortunately the Caudron monoplane has not recovered from being used as a scratching-post by cows, and so could not appear. Mr. Hamel was away in France, and was expected to arrive at Hendon during the evening with a new machine, but it was not ready in time for him to start.

After the speed handicap a large amount of quite pretty flying was done, Mr. Crawshay on his Blériot going out across country at a couple of thousand feet, and disappearing for the best part of an hour. Mr. Grahame-White and Mr. Turner flew the Howard-Wright with and without passengers, among Mr. Grahame-White's passengers being Mr. Charles Hubert, the victim of the "aerial post," who is now looking quite himself again. This was his first flight since his accident, and he came down positively radiant. The start of this flight looked like being a triple tragedy, for Mr. George Prenssiell, who had been flying an Anzani-Blériot very well for a number of circuits, was forced to come down by his engine failing as he was flying along the front of the enclosure. Just as he did so, Mr. Grahame-White swerved to the right across the course, so as to get a good start head to wind, and got into such a position that it was quite impossible for Mr. Prenssiell to see him, with the result that the wheels of the Blériot only cleared the biplane by inches.

Mrs. Stocks took out one of the big school biplanes which she had not hitherto flown, and, finding the controls heavier than those on the machine she had been flying, decided to land, but, not being used to the machine, misjudged its method of descent, and gave a very perfect exhibition of a pancake landing from about 30 ft., and it speaks well for the chassis that nothing was broken except a few wires. Everyone was most sympathetic to the plucky little lady, because, as a rule, her landings are exceptionally good, and it was hard luck that her worst landing on record should have been done before a crowd.

Mrs. de Beauvoir Stocks, one of the most capable biplane pilots at Hendon.

Later on, Mr. Moorhouse, having got his machine right, gave a splendid exhibition on the Radley and Moorhouse monoplane in the altitude competition, going up to 6,000 ft., and coming down in a beautifully judged glide. Mr. Hucks, on the old Gordon-Bennett Blériot, got up to well over 3,000 ft., but the machine is fitted with racing wings, and consequently does not climb very quickly.



Mr. Lewis Turner on the Howard Wright biplane winning the Cross-Country Race at Hendon on Saturday.

Towards dusk Mr. Richard Gates, the hard-working manager of the aerodrome, took out the Howard-Wright biplane and did some quite good flying, showing that he is not only a capable manager, but has the making of quite a good flier. He could easily take his certificate at any moment, but he believes that one does not deserve to be called an aviator till one has spent some hours in the air, which is certainly an encouraging attitude for a school manager to adopt.

At the Whitsun Meeting, during the next week-end, there will be a number of other competitors, for Mr. Hamel will then have his new machine, and Mr. Ewen will have the Caudron monoplane ready. Lieut. Parke, R.N., will almost certainly bring an Avro biplane over, and amongst other probable competitors are Mr. Moorhouse, Mr. Sopwith, and Mr. Valentine, so that an excellent show should be made if only the weather behaves properly.

The audience at Hendon is becoming more and more intelligent on points of good and bad flying, and the attendance of influential people continues to be very satisfactory, so that the missionary work which Mr. Grahame-White and Mr. Gates have set out to do is evidently in a fair way towards fulfilling its object.

The Circuit of London.

On Saturday, June 8th—next Saturday fortnight—the Circuit of London will be flown for the following prizes :—

1st.—100-guinea *Daily Mail* Trophy and £250 cash.

2nd.—20-guinea Trophy (a miniature aeroplane), presented by the London Aerodrome, Hendon, and 100 sovs.

3rd.—10-guinea Trophy (a miniature aeroplane), presented by the London Aerodrome, Hendon, and 50 sovs.

All the cash prizes have been presented by Harold Barlow, Esq., who deserves every credit for his generosity.

With £400 in cash and handsome trophies there should be very keen competition, and the event should be a gala day at Hendon.

Whitsun Flying at Brooklands.

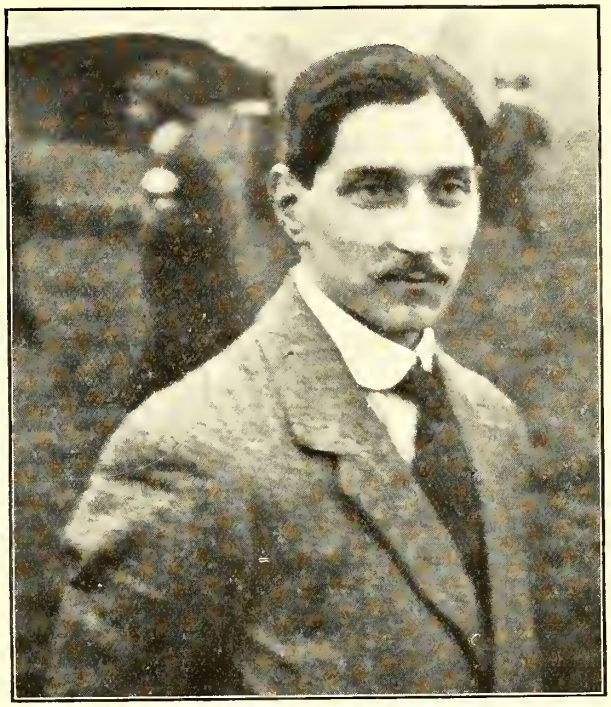
On Whit-Monday, at Brooklands, an aeroplane handicap will be held. It is to be run in two heats and a final. First heat at 5.20 p.m., second heat at 5.40 p.m, final at 6 p.m. The following are the entrants :—Messrs. T. Sopwith (Blériot), T. Sopwith (Burgess-Wright), R. L. Charteris (Hanriot), C. Gordon Bell (Bristol), E. Hotchkiss (Bristol), C. L. Pashley (Humber), A. V. Roe (Avro), M. Ducrocq (Hanriot), Capt. H. F. Wood (Vickers), Messrs. W. B. R. Moorhouse (Radley and Moorhouse), N. S. Percival (Percival), Herbert Spencer (Spencer), C. P. Pizey (Bristol), Lieut. J. C. Porte, R.N. (Deperdussin).

The All-Foreign Advertisement Tour.

The commencement of the *Daily Mail's* All-Foreign Advertisement Tour on Tuesday of last week produced one of the funniest incidents that has yet happened in connection with aviation. M. Salmet started from Hendon at about half past ten to fly to Wormwood Scrubs. Just for fun, Mr. B. C. Hucks, on Mr. Grahame-White's old Gordon-Bennett Blériot, started after him, and, owing to a slight fog, lost sight of him. However, Mr. Hucks flew straight over to the Scrubs, and was received with much waving of flags and many cameras. A crowd of Carmelite Street reporters and photographers rushed to the machine to receive the "heroic airman," only to find to their disgust that the hero was a mere British aviator. No Salmet had arrived, and after some delay it was discovered that the specially-selected exponent of cross-country flying had lost himself in the fog, and had to return to Hendon, with the result that owing to the wind he was unable to start again until 3 p.m., and all the reporters and photographers, and, incidentally, a large force of police who had been engaged to guard the Scrubs from 9 a.m. till 11 a.m., had to wait there till he arrived.

Just after three, Mr. Hucks started to fly back to Hendon and met M. Salmet half way, so he turned round and came back with him, landing after M. Salmet had done so, so as not to confuse the aviation experts of the daily Press, who could not, of course, be expected to distinguish between the new type Blériot racer and Mr. Grahame-White's venerable machine. Eventually Mr. Hucks got back to Hendon by 3.45 p.m., after having given a very pretty exposition of flying round Wormwood Scrubs in the course of five circuits which he made to get high enough for cross-country work. However, both machines were Blériots, so M. Chéreau scores both ways—good luck to him.

The humour of the situation is in no way lessened by the fact that Mr. Hucks' performance was never even mentioned in any of the papers. Presumably stealing the thunder of Jove is not appreciated by the Press.



M. Charles Hubert, the victim of the "Aerial Post," back at Hendon on Saturday.

A propos of the truly patriotic attitude in which the whole of this advertising scheme has been conceived, it is interesting to note that Mr. Hucks was reported by the *Evening News* as saying that the scheme was excellent. Unfortunately, presumably owing to the enormous pressure of sensational news on the space of that excellent paper, it was found necessary to cut out the latter part of Mr. Hucks' reply, in which he said he was sorry to see that British aviators were not given an opportunity. On Thursday, M. Salmet flew to Bath, and on Friday to Bristol.

A Warning to Spectators.

A fatal accident occurred at Lark Hill, at about 7 p.m., on Sunday last. Lieut. Ashton, who had been flying over Amesbury, brought his machine down near the sheds, and the crowd rushed out to meet him, several persons getting in the way before he could pull up. One man was killed and several others injured, three of whom were conveyed to the Bulford Military Hospital. The machine turned over, but luckily without doing further damage.

A British Aviator Abroad.

Mr. Sidney V. Sippe, who has been flying so extremely well on the Hanriot at Reims, has now been definitely engaged by Hanriot (England), Ltd., as chief pilot and head of the new school at Brooklands. During his stay at Reims, he has flown the Hanriot machines available, and at his very first attempt handled the machine perfectly. Mr. Maurice Ducrocq, writing from Reims, says that Mr. Sippe has given the aviators there an excellent sample of what British aviators can do, which only proves what The Aeroplane has always pointed out, namely, that what is the matter with this country is the country, and not the aviators.

A New American Star Flier.

A new American aviator who is said to be well worth watching is Joseph C. Stephenson, who, though he has long been connected with aviation, and was one of the pioneers at the Mineola ground, has only just come to the front as a flier. He has the reputation of being inclined to be reckless, as he insists on flying in weather when better-known aviators refuse to fly, but The Aeroplane is told by those on the spot that if he survives he is likely to be a dark horse worth following in the American Circuit.

The Engagement of Civilians in the Royal Flying Corps

Not long ago it was suggested in The Aeroplane that possibly civilians were not really wanted in the Royal Flying Corps. Since that date the writer has made careful inquiries, and is now convinced that not only are civilians welcomed if they will join the Reserve, but that there are great possibilities for those who are fortunate enough to obtain appointments to the permanent establishment. It is true that no pension scheme is at present arranged, and that no promise of permanent employment after four years' service as a flying officer can be given at the moment, but those who have faith in the future of aviation and in their own ability will find their faith justified if they have the courage of their convictions and join. Those who have followed the prediction of developments as set forth in this paper will, one believes, admit that they have not been far wide of the mark, and in this case the natural course of development is even more clear than usual.

Until there is more accommodation ready for men and machines, no great increase in *personnel* and *matériel* can be made, but it is safe to say that those in authority are already thinking in hundreds where they formerly thought in tens, and the Royal Flying Corps is going to be a very much bigger service than was thought even a few months ago.

One learns from a number of men of quite the right class that they have hopes of being accepted—on probation, at any rate—and taught to fly *ab initio* at Government expense. This is scarcely likely to be done, but a man who knows himself to be of the class required is not taking a very big risk if he speculates £75 in learning to fly, and then sends in his application. If he shows himself at the Central School to be something more than a mere pilot, he is fairly sure of an appointment to the permanent establishment, and he is bound in that case to receive a very fair amount of purely military training so as to qualify him for the command of his own machine crew, his "flight," and in time, perhaps, his squadron, in time of war. Probably he will be attached to a Regular battalion for a course of training, and, should he prove himself an efficient officer, it must be fairly obvious that, after his four years' flying service is over, all the trouble and expense of training him is not going to be thrown away, especially as the Army is by no means over-officered.

Should he elect to join the naval wing, much the same course is bound to ensue, the more so as the Navy is even worse off for officers than is the Army. One must remember that the batch of naval officers entered direct some years ago, commonly known as the "Hungry Hundred," turned out some excellent men, and, though direct entry is less common in the Navy than in the Army, there are very great possibilities for the officer-aviator who does well with the naval wing.

It scarcely seems likely that many of our present pilots will become officers on the permanent establishment, but that by no means bars new-comers who are of the right class socially, mentally, and physically from adopting this method of entering either Service, for it is rather less of a "back door" than was the old Militia, though, perhaps, it is not quite the front door, with awnings and red carpet complete, which some of our show fliers seem to think it ought to be.

The Reserve.

The Reserve is, however, quite a different proposition. It entails, at least, very great inconvenience in case of war, for a man may be engaged in important business, and yet be called out in a quarrel in which this country is only concerned as the ally of another country. He is, in fact, more likely to be called out than is a Special Reserve officer of the line. No doubt, however, a number of sportsmen who have no definite call on their time will join the Reserve, and it may be of interest to them to know that, if they care to bring their own machines to the Central School for the course of instruction, they will not only have all their running expenses free, and will have repairs done for nothing, as well as drawing their own pay, but they will be paid for the use of their machines while at the school. This last point has not been mentioned in any of the official papers, but the writer gathers that it is none the less a fact.

There seems to be at the moment a tendency in certain official quarters to endeavour to secure for the Reserve men whose value depends solely on their public reputation as fliers. Evidently the idea is that, if a few popular heroes can be induced to join, the less-known aviators will flock in after them. This is quite a mistaken idea, for if the regular steady every-day school pilots and the few gentlemen of independent means who fly for sport once get it into their heads that what the Government want are trick fliers, the very best men for war purposes will be lost. If one particularly desired to recruit a corps of nurses for field hospitals from the *corps de ballet* of the leading music-halls, it might be well to start by enlisting Madame Pavlova as a decoy duck; but if one wishes to raise a regiment of irregular horse, one does not begin by securing the services of the gentleman whose mission in life it is to poise himself on one toe on the saddle of a horse, what time he blows kisses from his finger-tips to the fairest of his rustic admirers round the circus ring. On the contrary, one seeks for men who can use a horse as it was intended to be used, simply as a means of locomotion, in the way calculated to tire it least and make its useful life as long as possible, and who at the same time can use their heads. Similarly, the fewer "stunt" fliers, and the more men with sound common-sense who can be got into the Reserve of the Royal Flying Corps, the better.

One cannot help noticing that, as, for example, after the recent meeting at the House of Commons, it is the men with newspaper reputations who are appealed to for opinions and advice. No doubt, a classical dancer can be received in the household of a Minister of State without upsetting the safety of the nation, unless, perhaps, an Ambassador of a great Power is asked to take her in to dinner, and there is, therefore, no particular reason why trick-fliers should not be also on friendly terms with those in high places, but there are many reasons why they are not the best possible advisers in matters affecting the efficiency of the Services.

The whole genesis of the Royal Flying Corps has been tainted with halfpenny-paperism. There has been too much flag-flapping, and talking about opportunities for doing daring deeds, and asserting that service in the air needs a special kind of courage. The best people do not say these things; they just do their work, and get it done. The best class aviators, the men with brains and not mere instincts for flying, do not need to have electioneering speeches made to them, and the surest way to keep them out of the Flying Corps is to tell them they are any special kind of hero. In a year or two the man who only possesses an instinct for flying will be worth a chauffeur's wage, and no more, to anybody. To-day he is worth no more for Service purposes.

The Royal Flying Corps Reserve can be made a success if it is treated seriously. If not, it will be killed by the ridicule of the very men who ought to be the backbone of the corps.

C. G. G.

The Royal Aero Club.

At the meeting of the committee on the 14th inst., the chairman referred to the sad accident which befell Mr. E. V. B. Fisher and his passenger on the 13th inst., and it was unanimously resolved that a message of sympathy be sent to relatives of Mr. Fisher.

The following new members were elected:—Lieut. Ivor T. Courtney, R.M.L.I., Oscar T. Gnosspelius, Roland H. Haxell, Bernard Isaac, Lieut. Gordon Strachey Shephard, Robert Bertram Slack, and Charles Alston Tyrer.

The following aviators' certificates were granted:—(214) Lieut. Alan Hartree, R.F.A. (Bristol biplane, Salisbury); (215) Lieut. Gordon Strachey Shephard (Bristol biplane, Brooklands); (216) Lieut. Donald Swain Lewis, R.E. (Bristol biplane, Brooklands); (217) Capt. Godfrey Paine, R.N. (Short biplane, Eastchurch).

At a special general meeting of the Royal Aero Club on the 14th inst. Mr. Roger W. Wallace, K.C., was unanimously elected a vice-president.

It has been decided to appoint club officials at the various centres to inquire into and report on all accidents, and the committee will be glad to receive offers of assistance from experts and those with technical knowledge, who need not necessarily be members of the club.

The Aero Club of Switzerland will organise an international hydro-aeroplane competition at Ouchy-Lausanne during the first fortnight in September. Manufacturers of hydro-aeroplanes in Great Britain wishing to take part in the competition are requested to communicate with the secretary of the Royal Aero Club.

Research at the National Physical Laboratory.

The penultimate lecture of the 1911-12 session of the Aeronautical Society was given at the R.U.S.I. by Mr. F. H. Bramwell on Thursday last, with Mr. F. Grant Ogilvie in the chair.

Mr. Bramwell commenced by regretting the fact that all

the work of the N.P.L. had to be treated as strictly confidential, so that he could only in this lecture deal with that part of the work which had already been published, which, however necessary it may be, is undoubtedly a pity.

He described some tests which had been made in water on various shapes of dirigible envelopes, saying that it was much easier to make these experiments in water (an undoubted fact), and that the results obtained are strictly comparable with resistance in air. This latter statement is rather startling, for one has always been brought up to believe that since the density of air is less than that of water, whereas its viscosity is much greater, therefore the perfect streamline body for air should be of a shape quite different from that adopted to use in water, the former being blunter forward and finer aft. Some experiments, conducted especially with a view to elucidating this point, would be of great interest to all designers.

The lecturer next showed some slides of the wind tunnel and the aero-dynamic balance installed in it, saying that, although there had been considerable difficulty with the apparatus, this was now believed to have been overcome. The first results described were those of a series of tests on single and multiple rudders and elevators, these results agreeing very nicely with the fine tests of M. Eiffel on biplanes of various curvatures and gaps. The centres of pressure on flat rudders for various angles of incidence were also tested, these results also agreeing very well with those of the accepted previous experiments.

While dealing with control-planes, Mr. Bramwell fell into a rather serious error by ascribing the invention of flexing control-planes to a certain British firm, apparently forgetting the existence of the Wright Brothers in America and Koechlin in France.

In discussing the tests for the Alexander prize of 1910, Mr. Bramwell showed some of the speed and torque records obtained during the runs.

Passing to the propeller-testing apparatus, the "whirling table" was shown, with the extremely clever recording apparatus used on it, whereby, on the development of a prearranged thrust, the revolutions, torque, and air speed of the propeller were simultaneously measured and recorded. The lecturer described the ingenious test made to determine the existence and speed of a rotary following current caused by the movement of the arm in a more or less confined space. He pointed out the error in pitch-finding caused by taking the pitch on the face of the blade, saying that at the N.P.L. all pitches were taken as the advance per revolution of the propeller when giving zero thrust, this giving a value of the order of 12½ per cent. above face-pitch for most propellers. (This, of course, is the method followed by Capt. Duchêne in plane calculations: to take the angle of incidence as measured, not from the horizontal, but from the angle of no lift.)

He explained that the results of propeller tests showed the thrust to be more or less proportional to slip (with a falling off at high slip percentages), and to the squares of the revolutions and the diameter, and claimed that, owing to the careful corrections made, and the excellent apparatus employed, the results were accurate to within 1·5 per cent.

Finally, he dealt with the experiments on plates of different sizes, with a view to measuring the variation of the "constant" K with the absolute size of the plate. He emphasised the fact that, since the only possible cause of variation of K is the kinematic viscosity of the air (*i.e.*, a function depending on its inter-molecular friction), therefore K, if it varies at all, must vary not only with the surface of the plate but with the speed of the current.

The Discussion.

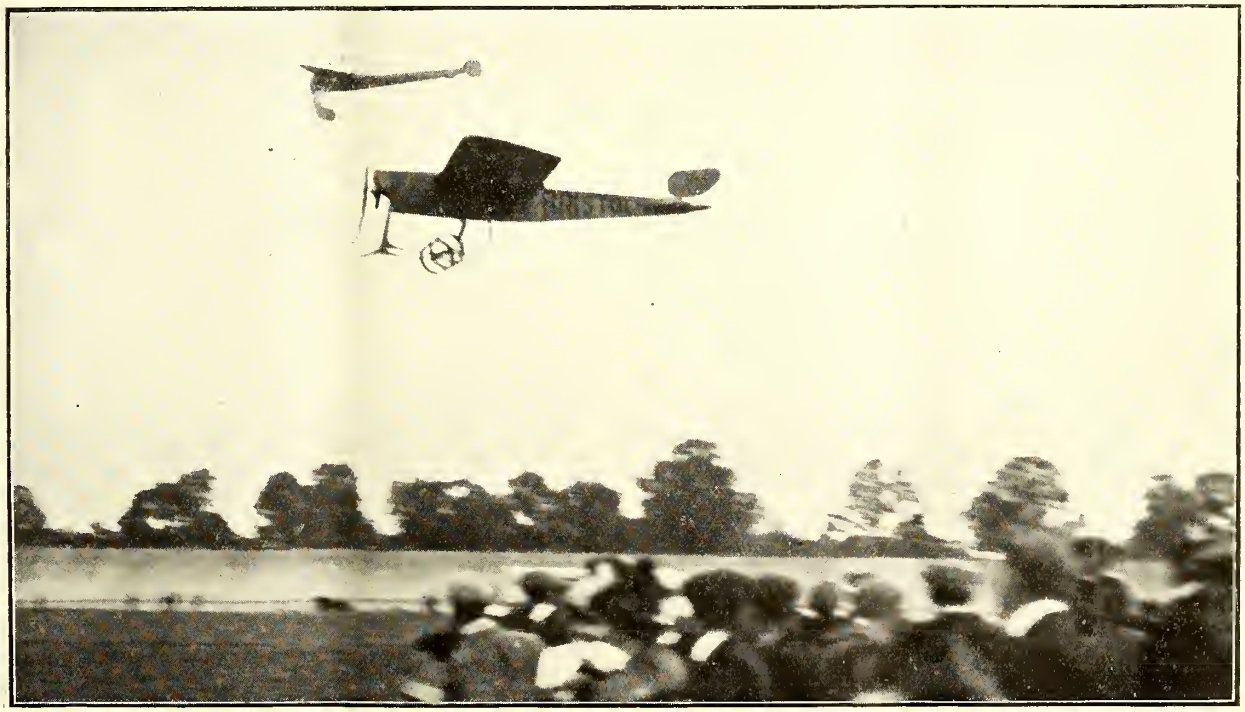
Mr. Handley Page asked whether any experiments had been made on the effects caused by interfering bodies in front of or behind propellers, and sketched on the blackboard a demonstration smoke-box of his design.

Mr. Cooper, who remarks unfortunately could not be very clearly heard, called Mr. Bramwell's attention to the error noted above in the discussion of elevators.

Mr. Archibald R. Low, referring to the secrecy as to late experiments, asked whether advance results could not be sent, in strict confidence, to serious designers, and commented on the fact that most of the *published* results had already been obtained elsewhere, suggesting that the title of the lecture might be "Recent Experiments—Minus One Year."

Mr. A. E. Berriman congratulated the N.P.L. on their excellent methods of overcoming incidental difficulties of exact experiment, and asked whether any coefficient of skin friction has been found which corresponded to the factor .003 in head resistance.

In his reply, the lecturer informed Mr. Handley Page that no experiments had yet been made on interference with propellers, as straightforward propeller work had been found quite sufficiently exacting. He regretted that he could not oblige Mr. Low with advance information, as publication of results was entirely at the discretion and in the hands of the Government Advisory Committee on Aeronautics. There was no V^2 coefficient for skin friction, but there was a $V^{1.85}$ law which gave excellent results.—P.K.T.



A CLOSE FINISH.—Mr. Gordon Bell on the Bristol beating Mr. Moorhouse on the R. and M. at Brooklands on Sunday.

The Week's Work.

Monday, May 13th.

Brooklands.—At Avro School, Lieut. Parke out on school machine to test air, after which Mr. Midshipman Wheeler out on tractor biplane for first time and took her to 400 ft. with ease.

At Deperdussin School, Signor Sabelli out on racer for 30 mins. at 1,700 ft. Admiral Fremantle, Colonel Dickenson, Lieut. Porte, MM. Deperdussin and Béchereau, and Mr. Santoni, directors of the new Deperdussin Company, at school, taking first official visit.

At Bristol School, 5.30 a.m., Mr. Hotchkiss took Capt. Henderson three circuits for first lesson, then up with Lieut. Percival, latter then rolling for 5 mins. Lieut. Bettington rolling and short straight flights for 10 mins. Mr. Hotchkiss solo on biplane. 5.30 p.m.—Mr. Hotchkiss two circuits test *No. 62*, which had been repaired and re-regulated. Then took Capt. Henderson for two circuits. Mr. Hotchkiss two circuits with Lieut. Anderson. Mr. Nesham then went off for solo, landing by Mr. Fisher's accident to see if he could render any aid. Mr. Hotchkiss flew machine back and closed school for night.

Dover.—The "Banished Aviator," Signor J. Nardini, who arrived here on Sunday, brought out his Deperdussin (50 h.p.) about 7 p.m., and, despite breeze, did a good flight of about 30 mins., flying over surrounding country and encircling Naval Harbour, being watched with interest by great number of townspeople.

Farnborough.—Lieut. Fox, on Farman *F.1.* biplane, one short flight. Then took up *B.E.3.*, and after going twice round Laffan's Plain, apparently had engine trouble and had to make rough landing near Gamma airship shed.

Capt. Burke up in *B.E.1.* (silent) biplane all evening, doing good passenger and solo flights. About 7.30, whilst Capt. Burke was flying, Capt. Loraine and Lieut. Conner arrived from Salisbury Plain on *B.5.* Deperdussin monoplane, and *F.5.* Bristol biplane, respectively. Mr. Cody was also making good flights on his biplane.

Hendon.—At Grahame-White School, Commander Yeats-Brown flying good straights on biplane No. 1, and Mr. Lewis Turner flying circuits, etc., for pupils' instruction, taking up Lieut. B. T. James and Mr. Malcolm Stuart for several passenger flights on biplane No. 10. Mr. Lewis Turner then in passenger seat instructing Lieut. James in rolling.

The Plain (Bristol School).—M. Jullerot first out, afterwards giving tuition flights to Mr. Prendergast and Lieut. Pickles, Mr. Bendall taking Major Boyd Moss. Good solos by Mr. Campbell and Capt. Cordner.

Mr. Pizey out in evening for trial, afterwards taking Major Boyd Moss for tuition in landing, also with Mr. Prendergast, letting the pupil take charge of control. Mr. Jullerot took up prospective pupil, and Mr. Pizey flew with Lieut. Pickles.

Waterloo (Liverpool).—Mr. Hardman out on Anzani-Blériot practising straight flights of mile and upwards, 40 ft. up. Mr. Birch also out on same machine and made several short flights.

Tuesday, May 14th.

Brooklands.—At Avro School, Lieut. Parke at Farnborough for tests.

At Sopwith School, Mr. Raynham out on dual-control Howard Wright with Messrs. Powell and Hedley.

At Vickers School, Mr. Macdonald and Col. Hoskins doing straights on *No. 3.*

At Bristol School, 6 a.m., Mr. Hotchkiss took Lieut. Anderson for two circuits, Lieut. Percival for landing and starting practice, and Capt. Henderson for three circuits at about 300 ft. Then up again with Lieut. Anderson for three circuits, after taking Capt. Henderson for another two circuits. Lieut. Percival flew two straight lines solus, making good progress.

Dover.—Signor Nardini out at about 7 a.m. and made two or three circuits for about 20 mins., but was compelled to come down owing to gusty wind, and broke small part of left wing.

Farnborough.—About 7 a.m., Lieut. Fox flying Farman, and Capt. Loraine *B.5.* Deperdussin. In evening, Capt. Loraine out again on Deperdussin for one solo and then one passenger flight, but in landing second time broke front skid, which let machine down on to propeller, which naturally broke. Capt. Burke out doing passenger and solo flights for about two hours (6 till 8 p.m.) on *B.E.1.* biplane. Mr. Cody also twice round common on his "Circuit" biplane. Lieut. Conner out on Bristol *F.5.* flying well. Lieut. Fox then took out *B.E.3*

Hendon.—Grahame-White School at work soon after dawn. Mr. Lewis Turner flying circuits, figures of 8 and landing *en vol plané* on biplane No. 10 for instruction to pupils, afterwards taking up Messrs. Malcolm Stuart, Norman Fuller, Kershaw, Manton, Lieut. James and Capt. Nicholas. Commander Yeats-Brown at straights on biplane No. 1 and Capt. Nicholas also at straights on monoplane No. 4.

The Plain (Bristol School).—M. Jullerot out early on new Bristol dual-control school monoplane, with Lieut. Fielding as passenger, then taking up Lieut. Wyness-Stuart and Mr. Pizey. Major Boyd Moss given high flight by Mr. Pizey, latter afterwards taking up new school monoplane to 800 ft. with Lieut. Fielding as passenger, and finding machine very easy to control and land. Mr. Bendall out giving tuition flights to Major Boyd Moss and Mr. Prendergast. Lieut. Pickles for first solo. Mr. Campbell made two circuits, landing very neatly.

Mr. Pizey out with Lieut. Ashton in evening, M. Jullerot also out on new school side-by-side monoplane with Lieut. Fielding, and afterwards with Mr. Goutt. Mr. Pizey took Mr. Prendergast and Major Boyd Moss. Mr. Bendall for a circuit. Good solos by Lieuts. Fielding and Ashton and Mr. Campbell.

Waterloo (Liverpool).—Mr. Hardman made complete right-hand circuit, part being heavily banked. He also had further practice at straights. Mr. Birch then flew about two miles, making perfect left-hand turn.

Wednesday, May 15th.

Brooklands.—At Avro School, Lieut. Parke doing excellent flying, first on school biplane and then on new enclosed monoplane.

At Bristol School, Mr. Hotchkiss took Lieut. Anderson for three circuits, then up with Lieut. Percival, latter then rolling and hopping. Mr. Hotchkiss then with Capt. Henderson for three circuits, and later for solo. Mr. Gordon Bell went out on two-seater military monoplane doing four large circuits at about 400 ft. Then went away again for another trip on same machine out over Golf Links for about quarter hour, making a most perfect landing upon his return and expressed his delight with much enthusiasm regarding the machine's flying abilities.

Dover.—High wind, no flyng. Farman biplane (Mr. Chalmers') arrived by rail from Eastchurch; to be used for school purposes. More hangars to be erected shortly, and it is expected that number of pupils will be at Dover this summer.

Farnborough.—Officer aviators flying before the King and Queen.

The Plain (Bristol School).—Mr. Pizey out at 11 a.m. with Lieut. Fielding, but weather too bad for tuition.

Thursday, May 16th.

Brooklands.—At Sopwith School, Mr. Raynham out on dual control Howard Wright with pupils.

Farnborough.—In evening Capt. Burke on *B.E.1.*, Lieut. Fox on *B.E.3.*, Lieut. Barrington-Kennett on Nieuport monoplane; also *B.E.2.* was up. All did good circular flights over common and towards Aldershot.

Hendon.—At Grahame-White School, in evening Mr. Lewis Turner had biplane No. 3 brought out, it having been in shops for repairs after smash by one of pupils, and flew several circuits for test, found machine flying low on left side and returned it to works for further adjustments, after which Messrs. Richard T. Gates and Lewis Turner both flew tests and found her in good running order. Commander Yeats-Brown straights on biplane No. 1 and Mr. Lewis Turner flying circuits for instruction.

At W. H. Ewen School, the Caudron biplane had its first school work, Major Skipwith (new pupil) and Capt. Chamier rolling and flying straights at first attempt, Mr. Ewen doing several exhibition flights.

The Plain (Bristol School).—High wind; no flying possible.

Friday, May 17th.

Brooklands.—At Avro School, Lieut. Parke out to test school biplane, after which Mr. Montague-Chambers (who got his brevêt on the Valkyrie last year) did some straights, finally damaging chassis slightly. Afterwards, Lieut. Parke up to 1,000 ft. for 20 mins. on monoplane, making fine spiral glide from that height.

At Sopwith school, Mr. Raynham very busy teaching pupils on dual-control Howard Wright: lessons given to Captains Alston and Howell and Messrs. Hedley and Powell. Mr. Sopwith testing Coventry Ordnance biplane with new chain-rollers, which appear quite satisfactory. Later, out on Burgess-Wright, now with 40-h.p. A.B.C. engine, which has made it about 10 m.p.h. faster than with Gnôme, and apparently lifts as well in spite of extra weight.

In evening Mr. Moorhouse flew to Hendon for competitions there.

At Bristol School, Mr. Hotchkiss out with Lieut. Anderson for three circuits, latter handling lever. Then up with Lieut. Percival. Mr. Nesham then went for brevêt, which he got in quite good style, keeping good average height of about 200 ft., and making very nice right-hand turns without losing height.

Eastchurch.—Mr. Jezzi out on his biplane with extension on lower plane, carrying passenger with ease. Mr. Ogilvie out on N.E.C.-Wright machine doing the usual consistent flying to which both he and the British-built N.E.C. are now well accustomed. Capt. Cardan doing useful straights on the Dunne biplane.

Farnborough.—Officer aviators again flying before the King and Queen.

Hendon.—At Grahame-White School, Messrs. T. O'B. Hubbard and Gates at circuits, Lieut. James rolling and doing straights, and Commander Yeats-Brown at straights on biplane No. 3. Capt. Nicholas, Mr. Biard, and Mrs. Stocks at straights on monoplane No. 4, and Mr. Lewis Turner testing biplane No. 1 previous to it being taken over for straights by Commander Yeats-Brown and Messrs. Morris, Roupelle, Kershaw and Manton.

At W. H. Ewen school, Capt. Chamier out on Caudron, Messrs. James, Edmund Lawford, Ware and Gist rolling and flying on Blériot. MM. Baumann and Dubois flying on Deperdussin. Mr. Ewen put up several fine exhibitions on Caudron.

The Plain (Bristol School).—Wind rather tricky, but tuition given to most of pupils.

Waterloo (Liverpool).—Mr. Hardman made first figure 8, succeeded by left-hand circuit, during which main outside stay of left-hand wing was seen to snap. Fortunately it swung clear of propeller, but balance being somewhat affected, Mr. Hardman fortunately came down without planing and so landed without disaster.

Saturday, May 18th.

Brooklands.—At Avro School, in morning Lieut. Parke took monoplane to 1,000 ft. in 4 mins., and after 10 mins. at that height descended in spiral glide.

At Sopwith School, in morning Mr. Raynham, on Howard Wright with Mr. Powell and Captains Alston and Howell.

In afternoon, quick get-off handicap productive of many qualms. Finally won by Mr. Spencer on own biplane with 3 2-5 secs. (handicap 4 secs., actual time 7 2-5 secs). Mr. Sopwith, on Howard Wright, a good second, and Mr. Raynham, on same machine, a fair third. Ten entries.

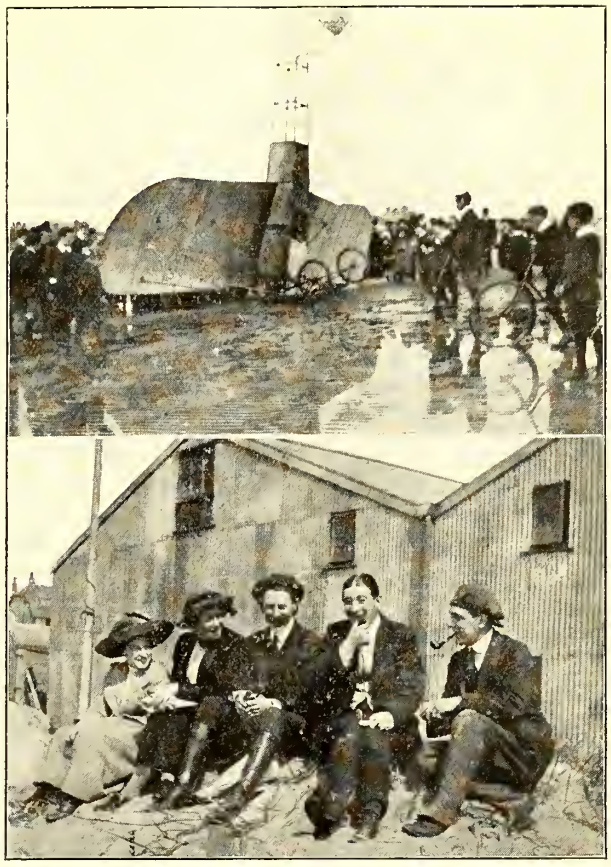
For cross-country six miles, five entries, who finished in following order:—Mr. Raynham (40-h.p. A.B.C.-Burgess-Wright), Mr. Hotchkiss (50-h.p. Bristol biplane), Lieut. Parke, R.N. (35-h.p. Green Avro biplane), Mr. Sopwith (70-h.p. Blériot), Mr. Gordon Bell (50-h.p. Bristol two-seater monoplane). Mr. Raynham beat Mr. Hotchkiss by about 20 yards, Messrs. Parke and Sopwith being 100 yards away, with 20 yards between them: a magnificent finish. After the race, quite a lot of excellent flying, Mr. Sabelli taking the 35-h.p. Anzani racer up to 1,700 ft., and staying there for half an hour, while Mr. Sopwith, on the Coventry Ordnance (familiarly known as "Jonah's Whale"), and Lieut. Parke, on the Avro monoplane, were doing very pretty flying lower down.

At Bristol School, Mr. Hotchkiss first up with Mr. Arthur for four circuits. Lieut. Percival several good straight lines. In evening, Mr. Hotchkiss went for quick-starting competition and then took Mr. Holyoake for his first trip. Later, Mr. Hotchkiss in cross-country race to Chertsey Bridge and back took second place. Mr. Gordon Bell, on two-seater military monoplane, in cross-country race, handicapped out of it, and after finishing circled round Brooklands several times. Mr. Hotchkiss for circuit with Mr. Bulckley. Lieut. Percival then doing straights and improving considerably. Bulckley doing straights in good form. Mr. Hotchkiss then up with Lieut. Bettington, and later with Mr. Arthur.

Eastchurch.—Mr. Ogilvie on Wright, Mr. Jezzi on Jezzi biplane, Capt. Carden on Dunne biplane, and Capt. Dunne on Dunne biplane, all doing good work. Mr. McClean on the 70-h.p. Short tractor took up several passengers, including Mr. Arthur Cooper, to a height of 900 ft. The handling of this machine by Mr. McClean is indeed a pleasure to watch. Professor Huntington out on Huntington biplane doing hopping practice.

Farnborough.—Capt. Burke up on *B.E.1.* about 10.30 a.m., Lieut. Fox on *B.E.3.* and Mr. de Havilland on *B.E.2.*; flew for about 1 hour. In evening three *B.E.* machines flying well, also Mr. Cody.

Hendon.—At Grahame-White School, Lieut. James straights on biplane No. 3, and Capt. Nicholas straights on monoplane No. 4, whilst Mr. Lewis Turner was, as usual, demonstrating to pupils, whose number during the week was swelled by three new-comers, Capt. J. M. Salmond, Mr. Ambrose G. Power, and Mr. A. Meredith Wynne. In afternoon, the Summer Meeting took place, fully reported elsewhere.



Mr. Hardman's recent descent. Below.—Miss Melly, Mrs. Melly, and Messrs. Melly, Hardman and Birch.

Capt. Chamier and Mr. Ware doing many straight flights on Blériot, latter with splendid regular landings from 25 ft.. Lieut. McMullen joined W. H. Ewen School.

The Plain (Bristol School).—Visit of Bristol Aero Club to Schools. Party numbered about 60 and included, amongst others, Alderman C. J. Lowe, Mr. and Mrs. Alan McArthur, Mr. and Mrs. H. White Smith, Mr. and Mrs. P. A. Thompson, Captain, Mrs., and the Misses Evans, Mr. J. Palin Evans, Mr. and Mrs. T. Egerton, Mr. and Mrs. A. E. Catford, Mr. C. R. Fry and Mr. H. James. Free flights were given to members; order of flights was settled by ballot. Special interest in two monoplanes just arrived at school to be tested previous to being despatched to Italy, to order of Italian Government. About 4 o'clock, although wind still very gusty, Mr. Pizey took up the first passenger as far as Fargo and back. After tea first passenger to be taken up was Mrs. P. A. Thompson. Total number of passenger flights made during afternoon was 15. M. Jullerot took up on new two-scater Lieut. Fielding, and afterwards Mr. Pizey took Mr. Lindsay Campbell. During afternoon total mileage was over 120 miles.

Waterloo (Liverpool).—Mr. Birch out making right- and left-hand turns for several minutes; also completed right-hand circuit with neat *vol plané* from about 50 ft. Mr. Hardman then took tiller and made complete figure 8 in some 4 mins., after which he made several straight flights up to about 80 ft., practising accurately executed *vols planés*.

Sunday, May 19th.

Brooklands.—At Bristol School, Mr. Hotchkiss testing. Lieut. Percival for straights. Lieut. Bettington on Anzani-engined monoplane doing quite good low flights. Mr. Arthur rolling for 10 mins. on Anzani monoplane. Mr. Bulckley sent for straight line and got over sewage farm, landed in a ditch and smashed all the under-carriage and propeller and one tail boom.

At Avro School in morning Lieut. Parke, R.N., Mr. "Rama" Smith, and Mr. Midshipman Wheeler out on Avro School biplane.

In afternoon, bomb-dropping competition, productive of great interest. Entries: Mr. Hotchkiss (Bristol biplane), Mr. Bell (Bristol monoplane), Mr. Spencer (own biplane), Messrs. Sopwith and Raynham (Howard-Wright biplane), Lieut. Parke, R.N., and Mr. Midshipman Wheeler (Avro School biplane). An easy win for Mr. Hotchkiss, who totalled 38 ft. for three throws, Mr. Spencer being second; but Mr. Sopwith and Mr. Raynham disqualified for insufficient height.

In cross-country race (two laps) five entries: Mr. Sopwith, with Miss Archer as passenger (Blériot), Mr. Hotchkiss (Bristol biplane), Lieut. Parke (Avro School biplane), Mr. Gordon Bell (Bristol monoplane), and Mr. Moorhouse (R. and M. monoplane). A close finish in the above order. Unfortunately Lieut. Parke and Mr. Hotchkiss were disqualified, under Mr. Handasyde's rules, for touching ground before finish, and matter is now subject for argument.

After race fine performances by Mr. Sabelli on Deperdussin racer, and Mr. Sopwith on Coventry Ordnance biplane, the latter going over the cross-country course to test speed of machine, and handling the huge machine like a racing Blériot. Also took up Mr. Gordon Bell as passenger, to show him someone in this country could still fly.

Unfortunately, two of the most interesting machines were not out while visitors were present: A.B.C. Burgess-Wright being in process of fitting with exhaust lifters, and Avro monoplane was out of commission owing to a bent tube in control, caused by landing on a turn and running on a wing-tip. This landing, though it slightly damaged the machine, was a magnificent example of piloting. Lieut. Parke ran out of petrol over middle of sewage farm at about 450 ft., and owing to fine gliding angle of machine could make a three-quarter turn while gliding, eventually landing down by river, and having to turn at full speed on the ground to avoid a bath.

Dover.—Signor Nardini out about 6.30 flying round the town and Naval Harbour in splendid form.

Eastchurch.—Messrs. Jezzi, Ogilvie, and McClean out flying on and off all day till dusk.

Farnborough.—Mr. S. F. Cody out in morning for trial, and then took Mr. Stanfield, of the Gyroscopic Engine Co., for flight over Laffan's Plain and Farnborough Common, afterwards taking Mr. Mario Arioli, of Cardiff, for similar trip, finding queer currents and *remous* at 250 ft., in spite of calm on ground. Mr. Cody's new monoplane nearing completion and promising to be terrifically fast.

Filey.—Mr. Brereton out on Isaacson-Blackburn, flying well in 15 m.p.h. wind, making in all 23 separate flights, seven of which were with passengers. Messrs. Scott and De Villiers both out doing straights, landing well in spite of wind. Mr. Scott made 11 separate flights of about 3 to 4 miles each, and landed perfectly in each case.

Hendon.—At Grahame-White School, as early as 4 a.m., Mr. Lewis Turner out instructing Commander Yeats-Brown in straight flights on biplane No. 1. In afternoon great deal of exhibition flying took place, including flights by Mr. C. Grahame-White on Howard Wright and old school 'bus, Mr. B. C. Hucks on his 50-h.p. Blériot, Mr. Ewen on his wonderful little Caudron biplane, Mr. Georges Prensseil on Blériot, Mr. Moorhouse giving fine exhibitions on new R. and M. monoplane, and Messrs. Gates, Turner, and Mrs. Stocks flew Howard Wright in fine style.

Mr. Grahame-White paid a surprise visit to the First Lord of the Admiralty, who, with a distinguished house party, was taking tea on the lawn at Hartsbourne Manor, near Stanmore. Mr. Grahame-White had flown from Hendon, with Mr. Hugo Rumbold as passenger. Taking leave of Mr. Churchill, he returned to Hendon, and shortly after flew with Mrs. Arthur Ducros to her home at Edgware. He had previously been flying with his fiancée, Miss Dorothy Taylor.

Mr. Charles Hubert, who nearly nine months ago broke both legs while in the "Aerial Post," made his first flight as a pilot since his accident, his first passenger flight being the day before.

At W. H. Ewen School, Messrs. Edmund and Ware out all morning doing splendid flights on Blériot. Lieut. Pennycuick and Kerrich each getting in six straights on Deperdussin in good style. M. Dubois doing good circuits round pylons, and Baumann dong straights on Deperdussin. During afternoon Mr. Ewen put up some fine exhibitions on Caudron biplane, making sharply banked turns for photographers.

Waterloo (Liverpool).—Mr. Birch out early and notwithstanding a 15-mile wind made two complete figures of 8 at about 60 ft., each trip over 5 mins.

The Introduction of the Dorman Engine.

On Wednesday of last week the directors of W. H. Dorman and Co., Ltd., of Stafford, entertained the technical Press and the aviation correspondents of the leading dailies to lunch at the Hotel Cecil to introduce to them the new Dorman aeroplane engine, which will shortly be turned out from the firm's works to the designs of Mr. W. L. Adams, who, as was noted recently, has been engaged as manager of the aero-engine department. Mr. Walter Haddon, who presided over a very pleasant gathering, stated emphatically the intention of his firm to give this country what it needed—namely, a thoroughly efficient engine for aeroplane work—and those who know Mr. Haddon of old may depend upon his keeping his word at all costs.

It will be remembered that Mr. Adams's engine of the period was described in detail in The Aeroplane some months ago, and the first engine turned out will be of this type, though various changes will be seen in detail. The outstanding feature of the engine is the internal air-cooling, which is effected by having a large scoop in the front of the crank-case, through which air is forced by the slip-stream of the propeller, or simply by the speed of the machine, in such a way that not only do the working parts keep cool, but a supply of warm air is forced under pressure through the carburettor, so giving practically a forced feed to the cylinder. A similar idea has been tried on other engines with marked success, though not carried right out as an integral part of the design. Another feature not found in other aeroplane engines in this country is the double-acting valve rocker, the same rocker and rod working inlet and exhaust through a double-acting cam.

That any engine turned out by the Dorman Company may be thoroughly relied upon is vouched for by the fact that the firm already make some of the most reliable engines in the motor trade, and have standing orders to the extent of many thousands of pounds per annum for the master-gauges used in Admiralty torpedo work.

The Dorman Company are out to prove the worth of their engines, and so are prepared to make very tempting proposals to any constructor who is willing to give one of their engines a really fair trial.

Experimental Models.

One of the most difficult things to get done properly is experimental work; if one gets a good workman, he often does not understand what is really wanted, and, if one gets the man who understands, he is often an indifferent workman. Those who want special work done, especially work involving intricate mechanism, will do well to remember the name of the Eclipse Manufacturing Company, of Richmond, who specialise on experimental work. The writer recently inspected the firm's workshop, and can vouch for the quality of the work done. Mr. Stevenson, the proprietor of the firm, has had thorough workshop training, and for some years he has been engaged on making special tackle for stage illusionists and conjurers, such as Chung Ling Soo and the late lamented Lafayette, and it is hardly necessary to point out that the machinery involved in the work of the modern illusionist is of a most delicate and intricate character.

A British Rotary Engine.

Some of those who have been connected with aviation for more than a year may remember a description of the Redrup Rotary Engine published by the present writer in an aviation paper which he then edited. After lying long in abeyance, this engine is now being revived by the Gyroscopic Engine Syndicate of Cardiff, with whom Mr. Redrup is working. The engine has now been been designed as a ten-cylinder engine of 150 h.p., and should give good results if properly made. The peculiarity of the engine is that the cylinders revolve in one direction, while the crank-shaft revolves in the opposite direction, so that it is possible to fit two propellers or tractors, one on the shaft and one on the engine casing, turning in opposite directions at half the speed of the engine in its relation to the crank-shaft. The result is that one can get an efficient pitch-ratio on each propeller, comparatively small diameter propellers, and yet five impulses per revolution of the engine to the shaft. Also, this system gives a true differential gear, so that, if one propeller is slightly out of pitch, the other one balances it. Incidentally, owing to the slower rotation of the engine in one direction and that of the shaft and fly-wheel in the opposite direction, there is a balanced gyroscopic action which should be beneficial. Mr. Christie, who is handling the engine in London, will be glad to hear *via* The Aeroplane from anyone who would care to see the drawings, or to observe a small engine of this type actually running.

Correspondence.

The Editor of The Aeroplane *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* The Aeroplane, 166, *Piccadilly, W.*

British Apathy.

Sir,—I notice that in your Editorial Notes in The Aeroplane recently you allude to the "hopeless apathy" of the people of England where aviation is concerned. Do you think this remark is quite justifiable in view of the neglect with which the public outside London is treated by aviators?

With the exception of the Circuit of Britain and, perhaps, two or three cross-country flights, the public has had no chance of seeing anything of aviation, still less of "British aviation."

It is all very well to see "Beaumont" drop from the clouds in the dead of night, and hear that he will leave before sunrise the next morning, but what of British fliers? Cody, Valentine, and the "Cross-Channel" fliers are the only men who come before the public eye, and the "man in the street" regards them as mere acrobats, and feels devoutly thankful that he is not called upon to emulate their achievements.

He may join an Aero Club and attend an occasional lecture and the annual dinner, but still he does not "believe in it." And why should he?

What we want is cross-country flying and plenty of it, and flying in accessible places properly advertised, with passenger-carrying at reasonable prices. You cannot expect a man to plank down £2 to £5 to have his clothes ruined by castor oil and his ears deafened by the roar of an unsilenced engine.

If the "aerial yacht" does not pay as a passenger-carrier, let us have an "aerial liner," with mechanically operated controls and reasonable accommodation. Give the public a fair chance of seeing what aviation is, and then, if they do not take to it as they do in other countries where it is properly exploited, you will be quite justified in accusing them of "hopeless apathy."

Bristol. Ryder V. Tivy.

[While sympathising to some extent with Mr. Tivy, one cannot agree with him. How many Bristolians ever take the trouble to find out whether new machines are to be tested by the British and Colonial Company's pilots at Filton, and go to see it done? Aviation meetings were held all over the country before Londoners saw any real flying, but the provinces were not interested. Where exhibition flights have been given by individuals, the pilots have been insulted by blackguardly exhibition promoters, and have been jeered at as cowards for not flying in gales. . Provincial men of wealth have done nothing to help in forming flying grounds, or in building machines, and quite well-to-do people sit in motor cars in the road rather than pay a shilling to come inside an exhibition ground. Not only are the bulk of the people apathetic, but they are mean, stupid, and unpatriotic. The present healthy state of affairs is due to an intelligent minority, not to the "people" as a whole, as is the case in France and Germany.—Ed.]

Aeroplane Controls.

Sir,—If, as you say, the accident to Mr. Fisher and passenger was caused by the pilot being thrown forward on to the control lever by a sudden dive, the position preventing him from raising the head of the plane, does not this suggest a flaw in the present system of aeroplane control?

The system used on the Flanders monoplane, and, I believe, in varied forms on most other aeroplanes, has been called the "instinctive" control, because to raise the head of the machine the pilot has to pull the lever back, and, to lower it, to push it forward, the idea being apparently that the pilot's instinct when he wants to ascend is to throw his weight backward, in the direction of the smaller supporting surface, and when he wants to come down, to help the descent by leaning forward. The weak point in it is revealed by an accident like this, in which the pilot found himself descending at such a steep angle that it was imperative he should raise the machine's head at once, and was unable to do so *because he was descending at a steep angle*—because, that is (his tendency being to fall quicker than the aeroplane), he was unable to pull the lever backward. According to the "instinctive" method, he would have to pull the lever back to ascend, and to do this in an aeroplane falling head first would be rather like trying to lift a chair while hanging over the back of it. Of course, it would make a difference if the pilot were strapped to his seat (as he could then only fall with the same momentum as the aeroplane), and I assume Mr. Fisher was not.

I venture to suggest that the system should be reversed—that is to say, that the pilot should push the lever forward to ascend (as he would most easily do when he most wanted to), and pull it *backward* to descend, as he would feel most inclined to do if his tail plane were getting too near the earth, and his own back too much in the horizontal plane.

If this should be adopted, I venture to suggest further that it might be called the "intelligent" control, as opposed to the "instinctive."

Wandsworth, S.W. F. A. G.

Fire at Brooklands.

Sir,—In your issue of the 16th inst. we notice in your reference to the death of Mr. Fisher a paragraph which reads:—

"As usual, the fire-extinguishers supplied at Brooklands refused to work, though, unfortunately, this would have made no difference in this case."

For your information, we enclose herewith a copy of a letter we have this morning received from Major Lloyd, Clerk of the Course at Brooklands, which will show you how exceedingly misleading is the paragraph in question. The impression likely to be created by your statement would be most damaging to us, as not only is the Brooklands Track, etc., thoroughly equipped with our Extinguishers, but we are doing a large and increasing business with these amongst the various flying grounds throughout the kingdom. We should therefore be much obliged if you would take an early opportunity of correcting the wrong impression which your remarks convey. We need hardly say that we quite appreciate the fact that the statement was made by you in good faith, and are sure you will welcome the correction which we are able to give you. Thanking you in anticipation,

For Kyl-Fyre, Ltd.,
W. Harrison.

Carlton House, Regent Street,
London, W.
May 17th, 1912.

Messrs. Kyl-Fyre, Ltd.,
12, Elms Buildings, Eastbourne.

Dear Sir,—I have much pleasure in informing you that immediately after the sad accident at Brooklands to the late Mr. E. V. B. Fisher on Monday last the fierce petrol fire which ensued was extinguished mainly by means of your "Kyl-Fyre," which proved entirely satisfactory.

Yours faithfully,
(Signed) F. Lindsay Lloyd,
Clerk to the Course.

Concerning a Competition.

Sir,—I find on page 481 of The Aeroplane of the 16th inst. that you state: "For some unknown reason the judges stopped Mr. Valentine from starting, and the whole race was declared off," etc., etc.

As this is entirely contrary to fact, the judges having no power under the Royal Aero Club Rules to declare anything of the kind, and certainly did not stop Mr. Valentine from starting, I beg that you will make further inquiries, and would suggest your speaking to Mr. Sassoon, who was present during the final discussion, and who, as a steward of the meeting, had alone the power to make the declaration and decision which is erroneously ascribed to the judges by The Aeroplane.

Colonel H. H. Massy.

[The correction is made with pleasure, and one takes this opportunity of acknowledging the valuable honorary work done by the Judges, Colonel Massy and Lieut. Hallowes, R.N. For "Judges," please read "Officials"—though which officials cannot now be ascertained—and it is possible that Mr. Valentine of his own accord did not start, thinking it the sporting thing to do.—Ed.]

Concerning the Gordon Bennett Race.

Sir,—I have read with interest the letter in a recent issue signed "Fair Play," a letter by an individual who, quite evidently, is wholly unacquainted with the subject about which he is writing.

If, however, your correspondent is seeking information I am happy to be able to enlighten him.

The answer to your correspondent's query is a very simple one—i.e., out of all the two hundred odd certificated British pilot aviators, only Mr. Gustav Hamel and myself have signified our willingness to represent Great Britain in this historic international contest, consequently, as by the rules of the

contest each country is allowed three representatives, it is obviously unnecessary for England to hold any eliminating trials, for we are already one representative short.

No one would more welcome the necessity for an eliminating trial than I should, for competition is the very essence of incentive to my sporting instincts, and under these circumstances I should strain every effort to be amongst the chosen three, for far greater credit and kudos would attach to those three representatives had they flown to victory in the eliminating trials than is the case under existing conditions.

In fairness to the other pilot-aviators of this country it is only fair to point out to your readers that probably only a very few of them could run the heavy financial risk and incur all the extremely heavy expenses which of necessity accrue to each of the chosen British representatives.

The contest is to be held at Chicago, in the United States, in September next, when, in addition to paying an entrance fee of £20, it is also essential to purchase a thoroughly up-to-date racing aeroplane at a cost of probably £2,000, and this machine, to be at all likely to win the contest, might be of little use for other purposes.

The representative will also have to procure a very complete equipment of spare wings, propellers, and engine parts, and make all the necessary arrangements for the transport of himself, his machine, and mechanics to Chicago and back to England—a by no means insignificant expenditure.

At a conservative estimate, and speaking from the practical experience I gained in the 1910 Gordon-Bennett contest held at Belmont Park, New York, I consider a sum of from £3,000 to £4,000 an essential expenditure for each British representative to stand any chance of success in the contest.

Your readers will readily appreciate the fact that, as the prize, if won, is only £1,000, there can be no possible commercial interest in the contest, and it is possible that this factor is in some measure responsible for the extremely small interest taken in the contest by the aeroplane manufacturers as well as the pilots of this country. C. Grahame-White.

Royal Aero Club.

Air Sickness and Hypnotism.

Sir,—Having heard that one of our most prominent aviators lost consciousness whilst flying in a monoplane at 1,500 ft. recently, an altitude insufficient to suggest "mountain giddiness," and further bearing in mind that the late D. G. Gilmour felt "giddiness" whilst monoplane flying on one or two occasions, it has occurred to me that hypnotism may possibly be the explanation.

It is, I believe, one of the accepted methods of inducing a hypnotic state to make the subject gaze at a whirling disc, which is precisely what an aviator is doing practically the whole time he is in the air on a monoplane. In fact, he is doing more than gazing at it, he is looking *through* the whirling propeller as a glance at any flying illustration will show to your non-aviating readers.

Perhaps some of those readers who are learned in hypnotic lore will give their opinions on the subject.

Royal Aero Club. R. O. Carry.

Nomenclature.

Sir,—I observe that some of your correspondents are much exercised as to a substitute for the term hydro-aeroplane. May I suggest that "nautiplane" would be both compact and appropriate, and would have the additional advantage that (subject, of course, to the approval of the *Daily Mail*) the pilot of a hydro-aeroplane might be distinguished from other aviators by describing him as a nautiman. Bas Blue.

A Constructor's View.

Sir,—I have read with interest "Some Lessons from Chalais-Meudon," by W. E. de B. Whittaker, and note that he says the investigations have been of incalculable advantage to French manufacturers and that he wonders whether the Royal Aircraft Factory at Farnborough could not help us in England.

Recently I was at Farnborough and was permitted by Mr. Mervyn O'Gorman to see what was being done. Mr. Green showed me over the factory.

I saw two most excellently fitted electric brakes for h.p. tests with a Canton-Unné motor on one, and a White and Poppe on the other. This is a department for calibrating anemometers, speed indicators, and other instruments for helping the designer, also one extremely interesting appliance for showing everything that happens to a machine in flight, viz., speed through air, angle of machine, altitude and movements of pilot's controls. This makes a simultaneous record of great value. I was shown the method of constructing planes; the fabric used in covering being quite the best I have seen. The method of constructing the fuselage, the propeller department, etc. The whole construction is excellent, and I learnt much from what I saw.

While I was there, Mr. De Havilland was flying the biplane in a gusty wind which averaged over 20 miles per hour. This machine strikes me as being practically unique, it is extremely stable in a high wind, fast and handy, and I can well believe that the gliding angle in a calm is 1 in 6. It climbs very rapidly and has considerable flexibility of speed.

Mr. Mervyn O'Gorman kindly offered to place valuable information at my disposal, of which I shall avail myself as soon as possible.

Richmond. L. Howard Flanders.

Flying Over Crowds.

Sir,—I wish to call your attention to the rather foolish habit of flying low down over crowded enclosures which is coming into fashion again at Brooklands.

This trick went out of fashion some time ago owing to some articles condemning it in The Aeroplane and other aeronautical papers, but now I am afraid these articles have been forgotten, for it is going on as badly as ever.

"It is an ill wind that blows nobody any good," and I hope that Mr. Raynham's happy escape (on which I wish heartily to congratulate him) on Sunday, the 21st, has opened the eyes of some of the Brooklands aviators to the dangers of the practice.

The 21st was a windy day, and Mr. Raynham was very sensibly flying at a reasonable height, but even then, if the cylinder of his Gnôme had blown off a few seconds earlier, it, or some other of the various parts he left behind him, might quite possibly have landed on someone's head, and it looked no mean projectile.

On the day before, however, nearly all the fliers flew very low down over the enclosures, which were crowded with motor cars, and if a similar accident, or an engine failure, or an unexpected lull in the breeze had occurred, the machine (not referring to Mr. Raynham's mount in particular) must inevitably have come down on the ladies in the enclosure.

I do not write this as being personally afraid of an accident—it is rather nice seeing a machine directly overhead, as long as it does not smother you with castor oil—but I do hope, to avoid the harm such an accident would do to aviation, our aviators will postpone flying over the heads of crowds until engines become sufficiently reliable to permit of the Royal Aero Club removing its ban on cross-town flying.

Harrow. "Harrovian."

[Those who consider the future of aviation as being more important than their personal glorification will cordially agree with these sentiments.—Ed.]

Methods at the Aircraft Factory.

Sir,—Your article in this week's Aeroplane will, I am afraid, give people a wrong impression about the Royal Aircraft Factory at Farnborough. They have just tested one of our biplanes, and we therefore think, in fairness to the Factory, it is as well for us to write to you on the subject.

The Factory is fitted up with a very good overhead travelling crane; and, we may say, trestles, etc., were provided. It is a bit of trouble to turn the machine upside down, but we did it all right, without any harm. In fact, we were given to understand the Factory had put one of their own biplanes through exactly the same tests.—A. V. Roe and Co.

(Per) H. V. Roe.

[It is very satisfactory to hear from Mr. Roe that the task was satisfactorily accomplished with the assistance of tackle supplied by the Factory, but prior information—which was not given by anyone connected in any way with the Avro firm—was to the effect that certain officials at the Factory at first insisted on the machine crews doing all the work of inverting the machine themselves, and later information is that the inverting process was only accomplished by swinging the machine upon end by the propeller boss and letting it down upside down. This method can scarcely be good for the "nose" of the Gnôme engine or its mountings, and is unfair to the machine.—Ed.]

[The Editor regrets that it has again been necessary to hold over a large amount of interesting correspondence.]

MISCELLANEOUS ADVERTISEMENTS

All Advertisements for this column should arrive at this office by 6 p.m. MONDAY, to ensure insertion.

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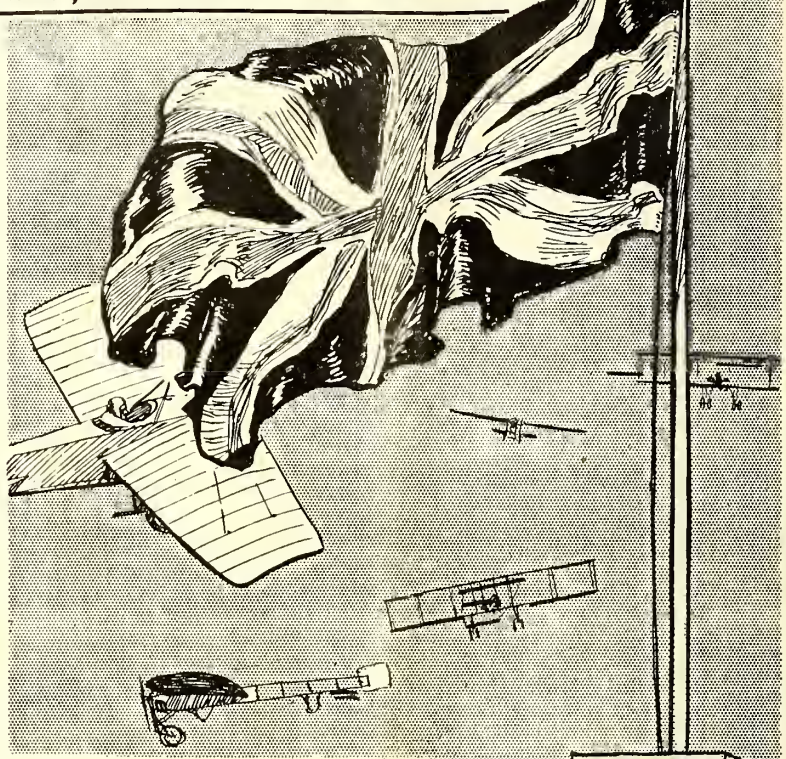
SECOND
LONDON AVIATION MEETING.

Saturday and Whit Monday,
MAY 25th & 27th.
(Weather permitting.)



PROGRAMMES.

Sat., May 25th, at 3.30 p.m.

1. CROSS-COUNTRY TEAM HANDICAP. PRIZES £60.
2. MONOPLANE SPEED HANDICAP For the BARLOW TROPHY and 50 sovs. (2nd 20 sovs., 3rd 10 sovs.).
3. ALTITUDE CONTEST for the St. Ivel Cup

Sunday Afternoon, May 26th.
EXHIBITION AND PASSENGER FLIGHTS by GRAHAME-WHITE and Competitors.

Whit Monday, May 27th, at 12 noon.

12 noon to 2 p.m. EXHIBITION FLIGHTS by GRAHAME-WHITE and Competitors.

2 p.m. Event 1. RELAY RACE. £60 Prizes.

3 p.m. Event 2. PASSENGER-CARRYING SPEED HANDICAP for Cup and 25 sovs. (2nd 10 sovs.).

4 p.m. Event 3. CROSS-COUNTRY HANDICAP, about 45 miles, for the GEISLER Challenge Trophy and 100 Guineas Cash (2nd 25 sovs., 3rd 10 sovs.).

5.15 p.m. Event 4. GRAND SPEED HANDICAP, open to all types, for Cup and 30 sovs. (2nd 15 s

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NEXT WEEK. SAT., JUNE 1st, At 3.30 p.m.

JUNE MEETING.

1. CROSS-COUNTRY HANDICAP.
2. GRAND SPEED HANDICAP.
3. ALTITUDE CONTEST.

Saturday, June 8th, First Aerial Derby ("Daily Mail" Trophy).
(Over a circular course of about 100 miles round London for "Daily Mail" Trophy.)
Saturday, June 15th, Second June Meeting.
Saturday, June 22nd, Second Summer Meeting.
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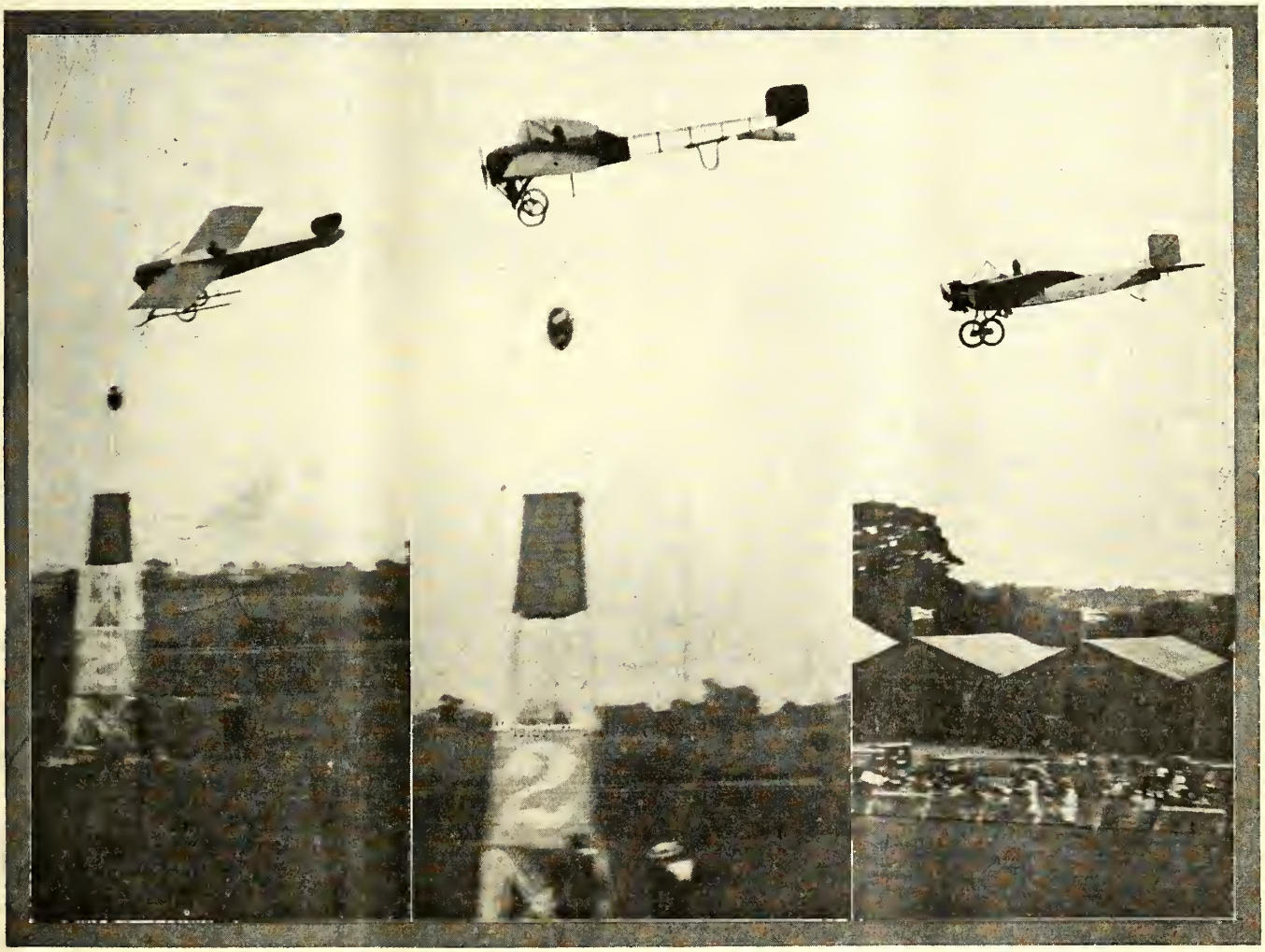
THE AEROPLANE

1D WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

VOL. II. [REGISTERED AT THE G.P.O. AS A NEWSPAPER.] THURSDAY, MAY 30, 1912. No. 52.

A STUDY IN ATTITUDES.



On the left, Mr. Valentine on the Bristol is shown banking round No. 2 pylon at Hendon. In the centre Mr. Hamel and Miss Trehawke Davies are taking the same pylon, Miss Davies crouching in the back seat to make herself into a "streamline body." On the right, Mr. W. H. Ewen is passing No. 1 pylon on the Caudron monoplane.

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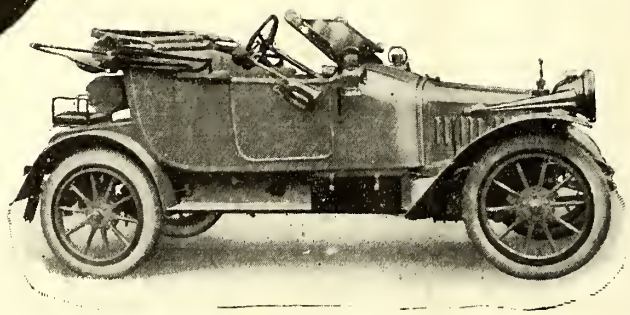

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MATTERS OF MOMENT.

CONSTRUCTORS' GRIEVANCES.

Although it is possible to give almost unqualified approval to the slightly modified rules of the Military Aeroplane Competition published recently by the War Office, regarding them simply as competition rules, there is, unfortunately, no gainsaying the fact that the constructors have been treated very inconsiderately by the authorities in the matter of time.

From the date of publication to July 15th, when the machines for the competitions have to be delivered at Farnborough, it is just two months, and it is sheer imbecility to suppose that any constructor can design an entirely new type of machine, test it, modify it, test it again, and tune it up to concert pitch in the time. It is, therefore, to be hoped that the date for delivery will be set back at least a month, or, better still, for six weeks, to give the aeroplane and engine builders a fair chance. If, as was expected, the final rules and regulations had been published two or three months ago, no one would have grumbled at delivering the machines by July 15th, but it is now practically impossible to do so.

The writer is strongly of the opinion that it would have been quite possible to have issued the rules in March, and it is highly probable that they would then have been issued but for the dilatoriness of someone. The military officials at the War Office, who have had the handling of the aerial defence scheme since it has been practically taken out of the hands of those officers who hindered its progress a year or so ago, are not only sincerely endeavouring to do their best for military aviation, but they realise fully that on the success or failure of the British manufacturer depends ultimately the efficiency or inadequacy of the Royal Flying Corps. Colonel Seely, the Under Secretary of State for War, despite his occasional errors in the treatment of prospective military aviators, who, after all, are not constituents to be wooed for the sake of their votes, is heart and soul a believer in aviation, and has practically staked his political reputation on his promise to place the aerial defences of this country on a sound footing, and while one may at times disagree with his methods, no one who knows him can question his sincerity of intention.

On the other hand, one knows that the Secretary of State for War, the Right Honourable the Viscount Haldane, lawyer and philosopher, not only does not realise the progress that aviation is making, but cares considerably less. In the natural course of affairs, and following the unavoidable routine in such cases, the regulations for the Competition could not be issued till they had received his august consent, and it seems quite a reasonable hypothesis to assume that even if the rules were all drawn up in March, or thereabouts, they might be put on one side while his Lordship discussed popular education with his friend the German Emperor, assisted in endeavouring to instil a philosophic regard for the law into the miners' delegates, or composed conciliatory speeches to be delivered to female suffragists. Admitting the possible correctness of this assumption, it seems reasonable to suppose that the official draftsmen of the regulations, drawing them up in February or March, put down July 15th as a reasonable date for the delivery of machines, which it would have been if the documents in the case had not been philosophically relegated to oblivion for a couple of months.

However, there fortunately appears to be a very likely way out of the difficulty. Apparently the Competition, and all that appertains thereto, is absolutely in the hands of the Judges' Committee for the Competition, and there seems to be no reason why that Committee should not accept late entries if it desires so to do. The judges will certainly be men possessing more than a little knowledge of aeroplanes, and a considerable supply of common sense, so presumably they would be willing to listen to reason. It therefore seems probable that if the British aeroplane manufacturers as a body, represented by the newly-formed manufacturers' section of the Royal Aero Club, were to memorialise the judges, or, perhaps better still, the War Office Committee which is dealing with military aviation, to the effect that the time is too short for them to do themselves justice, the date might well be altered to suit everyone.

The suggestion has been made by several journalists that the issue of the rules has been deliberately delayed so as to prevent the manufacturers from doing their best, and that the regulations have been framed so as to fit exactly the machines of the B.E. class turned out by the Royal Aircraft Factory; the plan being that the manufacturers' machines shall fail and the Factory machines shall succeed, and all future orders shall go to the Factory. Now, to believe this suggestion for one moment would be to accuse Colonel Seely and Mr. Mervyn O'Gorman of cold-blooded, scheming, deliberate untruthfulness, for the former has declared in the House and the latter to the daily Press that the Factory will not build machines in quantities, though it would have been more satisfactory if the meaning of "quantities" had been defined, for with four Factory machines flying to-day, and four more in process of construction, while the biggest order to a British constructor is four machines, a certain amount of suspicion may be excused.

What is, however, probably much nearer the truth is that the rules have been framed to fit the Factory machines so that the Competition must be won either by a B.E. machine or one just like it, and the War Office will then be able to issue orders to manufacturers simply for standardised copies of that machine, while the Factory officials have the satisfaction of saying, "I told you so; behold! our salaries are justified."

The delay is probably merely an accident due to the fact that the Minister for War, in his earnest desire for peace—per platonic flirtations with Germany—has forgotten that the surest guarantee of peace is preparedness for war.

Saul Among the Prophets.

A sign of the times, indicating that, after all, The Aeroplane was only somewhat in advance of its contemporaries in its attitude towards the War Office and the Aircraft Factory, is the very able article in the *Morning Post* of May 21st, by Mr. H. Massac Buist, who has for some time been regarded by those concerned for the welfare of the British aeroplane industry as the semi-official apologist for those institutions. Mr. Buist, in the early days of aviation, did most valuable work in educating the *Morning Post* readers in aeronautics generally, and it is a very great pleasure to find him again on the side of progress. Mr. Buist, however, errs somewhat when he states that "the whole of the distinctive features contained in the original announcement are now, for no explanation whatever, eliminated, so that the trials that are to take place will apparently teach us no more than was learnt from the French Government's military flying trials last autumn." True, the sole point insisted upon is that the machines shall be two-seaters, but that fact alone makes all the difference, for we are looking for very fast two-seaters as scouts, whereas the French were trying to evolve moderately fast weight-lifters as weapons against the German dirigibles.

The former essential points which now become merely desirable still count in favour of a machine, but failure on one or two of them does not disqualify a machine if it is particularly good on others, and consequently the Competition becomes a kind of "go-as-you-please," in which the constructor can lay himself out to develop the best qualities of his own design, and the Judges' Committee can please themselves as to which machine they think the best.

General Henderson's recent lecture ought to provide a useful key to the situation. Either make terrifically fast machines that can leave anything else behind, or a machine which will climb out of reach of attack, or else a machine with a clear field of fire in front and on each beam which can beat off attack from faster machines. The writer's advice is not to bother about the prizes, but to build for superlative excellence on one or other of the desirable points, for orders are bound to follow. Actually, the situation is much improved by the abolition of strict rules, for rules merely mean building freaks to get round them, or "faking" machines to qualify.

When Mr. Buist rails at the delay in issuing the final regulations, and says that, "As far as one can judge, the conditions in the document issued are practically those that can be fulfilled by the aeroplanes that came from the factory at Farnborough last week," he is hitting the nail severely on the head, and when he remarks further that "those conditions, be it remembered, are not necessarily those that are most desirable for military aeroplanes," he is stating a basic truth which may account for quite a lot of things. It may even account for the hard and fast rules being turned into a "free-and-easy," by those who really wish well to the independent constructor.

Mr. Buist's most astonishing sentence reads: "If the intention is to give a cheap advertisement to the Royal Aircraft Factory, by enabling it to steal a march on ordinary manufacturers, one can merely say that no credit will attach to any such achievement." There is in this an acerbity so unlike Mr. Buist's usual suavity of style that one realises at once how deeply he feels on the subject and how thoroughly changed his views must have been by recent developments in certain directions.

As a matter of fact, practically no aeroplane constructors, except those at the Aircraft Factory, have bothered much about the original specifications (M.A.C., A. and B.) beyond getting out designs on paper, for they have all been waiting for the final specifications and rules before starting actually to build, so that except in the matter of time no one is much worse off, and a certain amount of useful knowledge has been gained. It really looks rather as if some exceedingly practical person had discovered that the B.E. machines, which Mr. de Havilland has so ably designed to beat the original specifications, are not, after all, the best for military purposes, and had somehow succeeded at the last moment in cancelling all the definite points, leaving the whole thing absolutely at the discretion of the Judges Committee to select what they consider the best machines in the light of knowledge gained since the first specifications were drawn up. And that will probably put the B.E. machines out of court at once, so it is rather doubtful at present whether the manufacturers, as Mr. Buist puts it, have been "fooled" or whether the Aircraft Factory has been "sold."

A Little Time, Please.

Really, therefore, the manufacturers' chief grievance is the lack of time in which to build the machines the Royal Flying Corps wants—not the machines the Aircraft Factory thinks the Flying Corps ought to have. Let the manufacturers go to the Judges Committee straight away and ask for a month's delay, or even six weeks' delay, and it is more than likely it will be granted.

Not knowing what was really wanted, the manufacturers have not even ordered their engines, and the best engines—even of foreign make—cannot be delivered inside six weeks, so this alone is good ground for an adjournment of the start of the competition.

The War Office is really anxious to do what is best for the country, and, as Mr. Whittaker caustically remarked not long ago, "there are as good brains in the Army as ever stayed out of it," so a reasonable proposition is sure of reasonable consideration, now that the business of the Flying Corps is out of the hands of the museum of antiques who at first handled affairs.

Two Minor Grievances.

On the point of reasonable treatment, there is just

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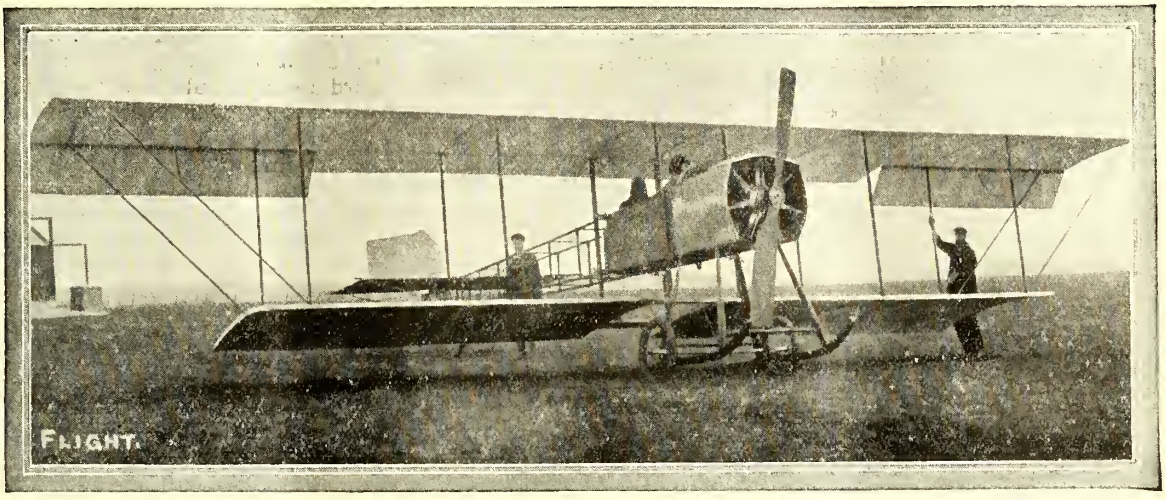

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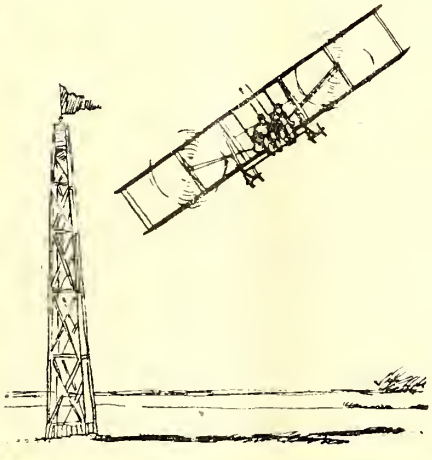

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one little matter in which the War Office might take a hint from the Admiralty. When a battleship is bought, the Admiralty hands over a certain sum of money when the keel is laid down; so much more when the plating is begun; and other sums at various stages; but an aeroplane constructor working on the "pre-competition machines" now on order has to finish the job before he gets anything, although the bulk of his money is laid out on the engine—of foreign make. Surely it would be possible for the Aircraft Factory—which seems to be the store-house of the Flying Corps—to buy the engines and supply them to the manufacturers of the aeroplanes, instead of hampering the constructors' finances.

Another small point is that if an officer goes to a civilian school to learn flying, he puts down his £75 in advance, out of his own pocket, but if he is appointed by the War Office to go and learn a certain machine, the constructor is not paid for his tuition till after he has learned to fly, which is not logical, or just.

Perhaps someone in authority in connection with the aerial defence scheme will be good enough to look into these grievances, and see whether the terms cannot be arranged on a more equitable basis.

The Naval Wing of the Royal Flying Corps.

Land has been purchased adjoining the Royal Aero Club ground at Eastchurch on which to erect sheds and workshops for the naval wing of the Royal Flying Corps. One large building is almost complete.

It is announced that Lieutenant Wilfred Parke, R.N., and Sub-Lieutenant F. E. T. Hewlett, R.N., both certificated aviators, will join the naval wing at Eastchurch "for a course of training in aviation"; Mr. Parke's "course" should not take long, as he is certainly one of the dozen best fliers in this country, and has probably more experience as passenger or pilot of different machines than anyone. Engineer-Lieutenant E. F. Briggs is appointed to the naval wing in place of Engineer-Lieutenant C. R. J. Randall, who joins the staff of the Central School at Up-Avon. The latter has been for some time at the Royal Aircraft Factory at Farnborough studying the engineering side of aviation. He is a certificated aviator, and should fill his new post with distinction.—C. G. G.

The Royal Aero Club.

A meeting of the Public Safety and Accidents Investigation Committee was held on May 21st, 1912, when there were present: Colonel H. C. L. Holden, C.B., F.R.S. (in the chair), Mr. A. E. Berriman, Mr. G. B. Cockburn, Mr. F. K. McClean, Mr. W. O. Manning, Mr. Alec Ogilvie, Mr. Mervyn O'Gorman, Sir Charles D. Rose, Bart., M.P., Major-General R. M. Ruck, R.E., and the Secretary.

An inquiry was held into the circumstances of the fatal accident at Brooklands on May 13th, 1912.

The reports of the various eye-witnesses were considered, and Lieut. J. C. Porte, R.N., Mr. A. Dukinfield-Jones, Mr. L. Howard-Flanders, and Mr. F. May kindly attended and gave evidence. The meeting was adjourned till the following evening.

British Empire Michelin Cup No. 1.—The winner of the prize of £500 for the year 1912 shall be the competitor who, on or before October 31st, 1912, shall have remained the longest time in the air on an aeroplane in one flight without touching the ground. The flights may only be made between the hours of sunrise and one hour after sunset, and in order to qualify for the prize the competitor must make a continuous flight of at least five hours.

The entrant, who must be the person operating the machine, must be a British subject, flying on a British-made aeroplane, must hold an Aviator's Certificate, and must be duly entered on the Competitor's Register of the Royal Aero Club.

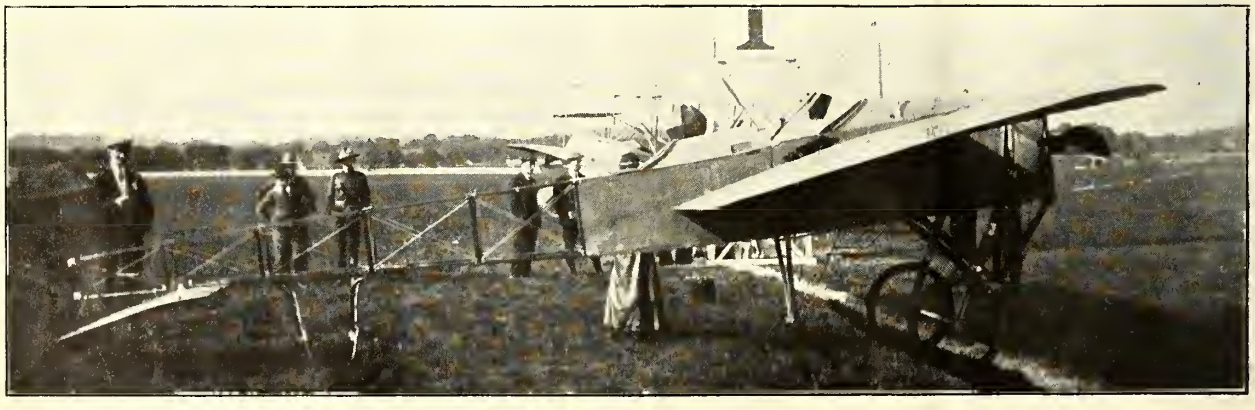
British Empire Michelin Cup No. 2, £600.—The contest for the current year consists of a cross-country circuit of about 186 miles. Competitors may choose their own course, which must be previously approved by the Club. The competition is now open.

Mr. Grahame-White's Marriage.

A marriage has been arranged between Miss Dorothy Cadwell Taylor, only daughter of Bertrand and Mrs. Leroy Taylor, of 784, Fifth Avenue, New York, and of Watertown, New York, and Claude Grahame-White, the well-known aviator, second son of the late John Reginald Grahame-White, of Fairholme, Faygate, Sussex. The wedding will take place on Thursday, June 27th, at Widford Church, Chelmsford, and the reception will be held at Hylands, the residence of Sir Daniel and Lady Gooch. The Aeroplane tenders its sincere good wishes for the future happiness of Mr. and Mrs. Claude Grahame-White.

Mr. Moorhouse's Engagement.

The engagement is announced of Mr. W. B. R. Moorhouse, whose flying is now quite one of the attractions at Brooklands and occasionally at Hendon. His fiancée, Miss Morritt, is herself keenly interested in aviation, and one understands that Mr. Moorhouse will not give up flying after his marriage, which is to take place during the summer; though, possibly, as a married man, he will not make quite such a speciality of flying in rough weather as he has done hitherto. Mr. Moorhouse, though not so well known to the public as his ability entitles him to be, is quite one of the finest cross-country fliers in England, and he is one of the few aviators who fly for the pure fun of the thing. He is extremely popular among his fellow-aviators, and everyone will wish him and his charming bride-that-is-to-be every happiness. The wedding is to take place on June 25th.



The new Military Tandem Two-seater Blériot which Mr. Hamel and Miss Trehawke Davies flew from Paris last week. The passenger has a protective cowl similar to that fitted for the pilot, and has a clear view under the wings. The machine has a 70-h.p. engine, and its speed when in proper flying tune is something over 70 miles an hour.

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Observation—*(continued).*

BY W. E. de B. WHITTAKER.

The method of collecting and recording information by observers in aeroplanes has not yet reached an advanced stage of definition in any army. The air corps of the different nations are sufficiently satisfied with the gaining of further experience in the art of flying without making excursions into the innumerable military problems of aviation. Such observations as were made during the French manœuvres were not detailed except in a few cases. General officers commanding army corps were so surprised and pleased at the additional information received that they did not insist on the minute detail which it is possible to obtain from a highly-trained and intelligent observer. One or two observers have during aerial journeys taken exhaustive notes of the country traversed, but usually without special fittings for the purpose. Aviation is still so much in the experimental stage that it is yet difficult to place things on a practical footing.

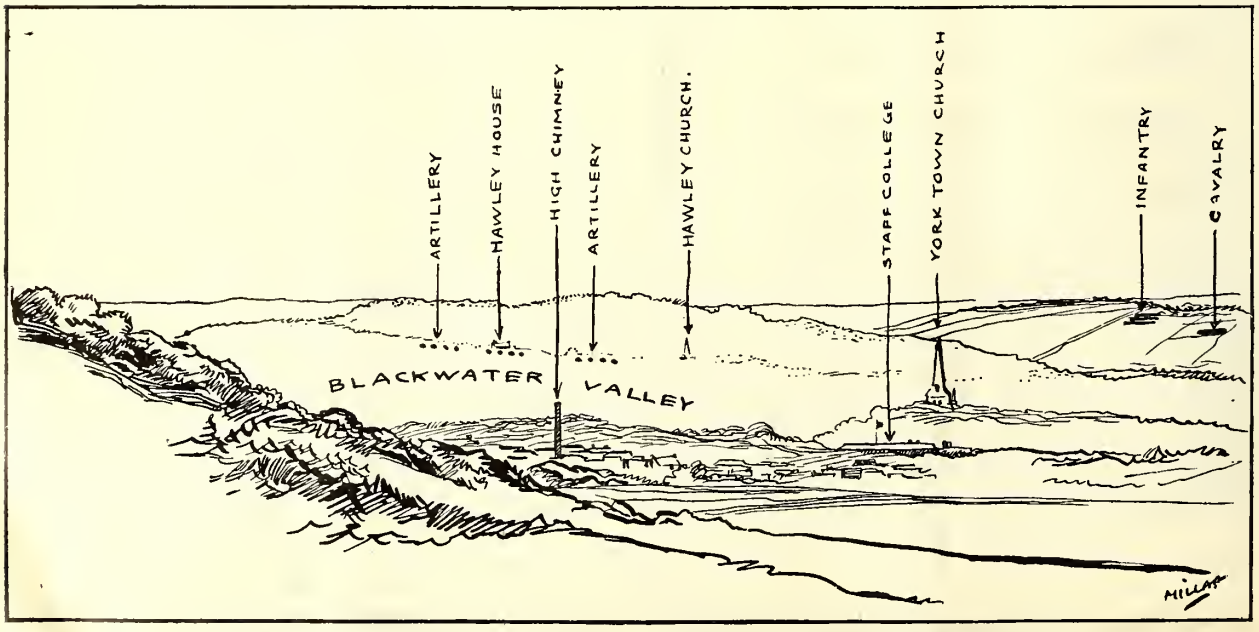
The comfort of the observer is of importance. If the observer is in a position of comparative discomfort it will militate greatly against his efficiency as a scout. It is not a matter of great difficulty to arrange that the passenger shall be in an undisturbed position. His outfit requires careful selection. Weight is a serious consideration. He will need field-glasses, a writing block, a map-case, pencils and perhaps a camera. Captain Brooke-Popham, Oxfordshire Light Infantry, in a recent lecture at the Staff College, suggests that the ordinary talc face of the map case should be slightly roughened to take pencil marks. This, so far as it goes, is of use, but it would be much better to construct a case in which the map is mounted on rollers with a layer of tracing paper above it, also mounted on separate rollers. Then if mistakes are made it is sufficient to turn the roller a little and a new surface of tracing paper will be exposed. By this method also it is possible to detach a rough sketch having considerable detail and accurate as to dimensions from the roll of tracing paper and, weighting it with a leaden clip, drop it in the neighbourhood of the staff without landing. The map-case may be suspended by rubber springs from the sides of the fuselage. Except in the reconnaissance of fortified positions the use of telephoto cameras will be of little advantage.

General officers commanding armies within striking distance of an enemy have several recognised means of obtaining information, means sanctified by the custom of the ages. Useful reconnaissance has until recently been confined to investigation by scouts on the ground. Hearsay, the reports willing or unwilling of the natives, and the intelligent use of eyes and ears by trained scouts are the sources from which a general forms his opinion of the enemy's dispositions. Captive and free balloons have been used on occasion during the last hundred years, almost invariably without results of high importance. The average altitudes at which captive balloons work is about 1,500 feet—this under ordinary conditions with one man only. The altitude decreases according to the strength of the wind. On perfectly calm days it is possible to attain a height of 3,000 feet with the type of captive balloon employed in the British Army. Free balloons are of little use as, like Mr. Kipling's cat, they "walk by their own wild lone," and are not amenable to that persuasion which would have them return home at a desired time, or even any time at all. The dirigible balloon ranks with the aeroplane as a scouting agent, and therefore comes within the bounds of this article.

There is one vital axiom in the art of reconnaissance which says "That to have no information is better than to have false information." False information makes much of one's good information doubtful and doubles the difficulties of the intelligence department. The circumstantial counts for a great deal in the reports of a good scout of the present type, and it is this circumstantial element which leads to constant errors of great magnitude if not carefully examined.

Scouting in Three Dimensions.

In the making of reports as to the position held by the enemy the trained scout (I use the word "scout" to cover all those engaged in reconnaissance) elucidates and explains his statements by sketches and plans. If he has good maps of the country, as the Ordnance Map in the case of England, his work is much simplified, and he has merely to add such observations as he desires to the map itself. He also makes profile sketches of the country—sketches which more closely resemble an artist's preliminary outline for a picture than anything else. On them he draws the position of such troops as he can see



Landscape sketch taken from a point N.E. of Camberley, shown in map form on p. 521.

with additional explanatory notes as to the nature of the country.

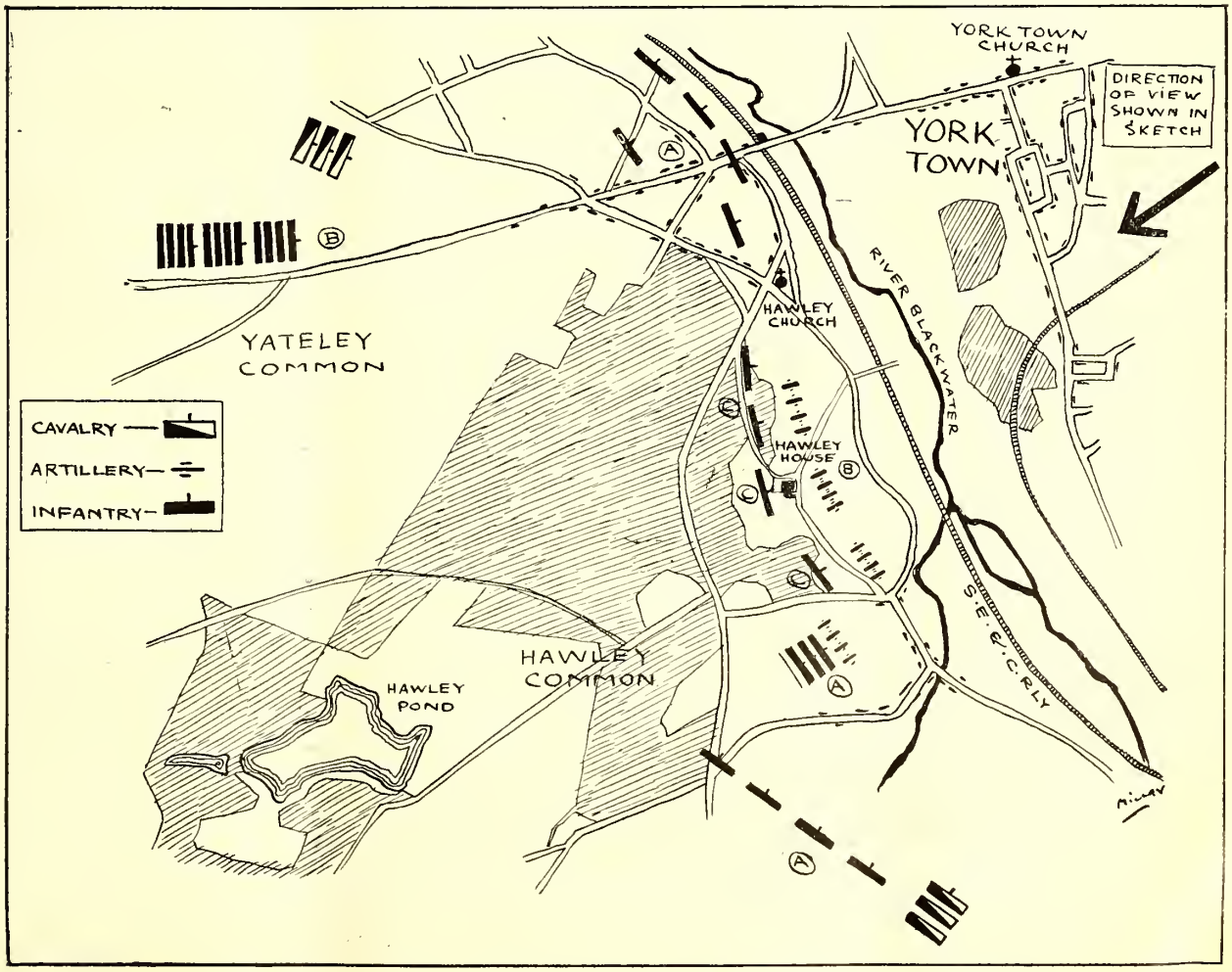
From above it will be understood that it is only possible to see the country in plan with but the faintest indications of the varying heights of different portions. The highest range of hills and the deepest valleys differ but little when seen from three or four thousand feet. On the other hand the scout who works on land is limited more or less to a profile view. He cannot tell by sight what may lie behind a range of hills, or a thick wood. He has to use his skill and instinct and knit every available item of information into a homogeneous whole. From this it will be seen that the aerial scout and the land scout working alone are at a disadvantage, but working intelligently together they form a strong combination, and it is training in this co-operation that is desired. It is, of course, the duty of the Staff to collect and arrange all the reports of the different reconnoitring parties, but much can be done by an earlier meeting between the two types of scouts. Captive balloons and man-lifting kites (the maximum practical altitude of a man-lifting kite is 2,000 feet) are merely extensions of the land scouts' view. One cannot operate with them over the enemy's position or even over the advanced portion of one's own position. A larger view is obtained, that is all.

The aeroplane scout should take a leaf from the book of him who works on land, and before ascending take a profile sketch of the country over which he is to work that he may be able in some degree to remember the contours of the land below. All this, of course, refers to tactical reconnaissance only, as in strategical reconnaissance minute detail is neither possible nor essential.

A Concrete Example.

To take a concrete example. I print two sketches, one a rough landscape sketch of a tract of country on which a hypothetical enemy has taken up his position, and the other a simple map of the same country. As I have had them reproduced from sketches made by others, and have no personal knowledge of the district, considerable liberties have been taken with the country in the disposition of the troops. I may have placed a brigade of infantry in a marsh or on a church steeple. Therefore the maps must be read as they appear, and not according to the actual country.

In the landscape sketch are the enemy's troops so far as they can be actually seen by the opposing staff. The troops marked A on the map are invisible, or, if in sight, of quite indefinite strength. In order to form any real idea of the enemy's strength the Staff must now rely on varying reports from the scouts employed. Owing to the nature of the ground a cavalry reconnaissance in strength is impracticable and wasteful. Reconnaissance of a useful nature is not carried out in a few minutes. Hours may elapse before information of value is received. It is possible, therefore, that engagement would begin whilst the Staff's knowledge of the enemy's position was still imperfect and unreliable. The disadvantages of such procedure are obvious. To the land scout the artillery and infantry at B and C are visible, and he can roughly gauge their numbers. But that is all. If, on the other hand, an aeroplane is sent up with a trained observer aboard the whole expanse of country becomes as a plan. He can place the position of the entire opposing army on his sketch map and he can make a rough approximation of their numbers. The infantry at C will



Sketch map of a portion of the Blackwater Valley in the neighbourhood of Camberley.

baffle him owing to their being in the wood. He knows they are there, but of their quantity he is almost entirely ignorant. Not only can he see how the troops lie, but he can see their movements. The strength or weakness of their position is clear to him, and a short cruise will reveal to him what supports they have. He can see that if they could be compelled to retire even half a mile their line would be completely broken owing to the dense wood lying behind Hawley House. They have neglected that precaution of good generals—they have no unbroken line of retreat. Wellington was in the same position at Waterloo, but he had no need to retire, and the things that might have been have no place in history. The observer ought to be able to select the most vulnerable point of attack, subject, of course, to the general plan of campaign. The sketch and map only represent at the best a fraction of the front of a modern army preparing for action. A battlefield of the present day is nearer fourteen miles than four in extent. From this it will be realised how complex and difficult are the duties of an aeroplane scout. Perhaps also it will be seen how impossible would be the position of a pilot who had also to act as scout. Such fleeting impressions as he might have would be as inaccurate as are most products of the imagination. The need for carefully made landscape sketches is also demonstrated. The aviator who fondly imagines that a fleet of aeroplanes will revolutionise war is doomed to deadly disappointment when his theories are put to the test. The aeroplane simply improves the eyesight of a general officer commanding. It does not give him the power to pierce opacity. The limitations of both types of scout are many, but they are not the same, and co-operation can work wonders. The aeroplane is a unit of an army, though some politicians would have us believe that in the future armies will be but useful appendages to a brilliant corps of well-known exhibition fliers. The art of war is the product of countless ages, and it cannot be reconstructed in a few months. The lessons learnt and put on record by the world's greatest generals stand no risk of refutation and alteration at the hands of even the most illustrious of cross-country aviation.

Military Aeroplane Competition, 1912.

The following are the rules and regulations set forth in M.A.C. Form D, relating to the Military Competition.

1. Definitions.—The word "Competitor" shall include any person or corporate body making entry for or taking part in the Competition, and shall include the flier, mechanic or passenger other than the official observer.

2. The word "Passenger" shall include the flier and mechanic, and shall mean a person of not less than 18 years of age and weighing not less than 132 lb., provided that any deficiency in weight may be made up by means of ballast or by excess of weight in the other passenger.

3. The word "Aeroplane" shall be inclusive of the entire apparatus, as submitted for test, including the engine and usual accessories.

4. The word "Person" shall include one or more persons or a corporate body.

5. Every "Competitor" shall be presumed to be acquainted with and shall submit to and be bound by these Rules and Regulations, and any further instructions issued hereafter in regard to the Competition. Any such further instructions shall be supplementary to and shall not supersede these Rules unless with the consent of the Judges Committee. All words herein defined shall in all such instructions be deemed to bear the same meanings as herein expressed unless the contrary is specifically declared in such further instructions.

6. Entrant Responsible for Flier.—The entrant shall be responsible for all acts or omissions on the part of his fliers, passengers and mechanics, and each or any may be held responsible for any infraction of these Rules.

7. Competitors must be Registered.—No flier shall be allowed to fly an aeroplane in the Competition unless he be a holder of the Flying Certificate issued by the Royal Aero Club, or such foreign certificate as is recognised by it. Nevertheless, any individual flier may be refused permission to fly in the Competition without any reason being assigned.

8. Change of Flier.—Each aeroplane shall be flown throughout the Competition by the same person. If a change of flier is necessitated the consent of the Judges Committee must be obtained after reasons given in writing and signed by the competitor.

9. Identification Marks.—Every aeroplane shall, during the Competition, carry in a conspicuous place the numbers or other identification marks allotted to it by the Judges Committee.

10. No Advertisements to be Carried.—No conspicuous advertisement or trade sign, other than small plates carrying the name of the aeroplane or of the maker, shall be carried, and no advertisement shall be distributed from any aeroplanes during the Competition.

11. Overtaking and Passing.—Passing, overtaking and crossing shall be governed by the rules issued separately.

12. Dangerous Flying.—Flying considered by the Judges Committee to be dangerous to other competitors or to the public will involve such penalties to the competitor, including possible disqualification, as the Judges Committee may see fit to impose.

13. Enclosure.—No person except the officials, the fliers and their assistants, for whom a strictly limited number of personal permits must be obtained, shall be allowed within the enclosures and trial tracks except with the special permission of the Judges Committee.

14. Postponement or Abandonment.—The Competition and each item thereof may be postponed or any item abandoned at the discretion of the Judges Committee, and in the event of such postponement or abandonment no competitor shall, except as provided herein, have any claim against the Judges Committee or the War Office.

15. Control of the Competition.—The supreme control of the Competition will lie with the Judges Committee. Officials will be appointed by the Judges Committee.

16. Duties and Powers.—The Judges Committee shall decide the winning and the placed competitors. Their decision shall be final and without appeal. Nevertheless, nothing herein shall prevent the Judges Committee from correcting a mistake. No decision of the Judges Committee shall give any claim to a competitor who is subsequently shown to have failed to observe these Rules, or who shall have been disqualified or otherwise have been ineligible.

17. Interpretation.—The Judges Committee shall alone have power to interpret, alter, amend or cancel any of these Rules and the other instructions issued relative to the Competition, and to forego any test or any requirement, or to enforce other or further requirements in particular cases, either arbitrarily or with a view to obtaining the information necessary to make their award.

Some of the more important points in M.A.C. Form C are as follows :—

"Oil and petrol will be supplied free for the tests. Those competitors who desire to use their own fuel and lubricant shall state in writing the make and constituents of such fuel and lubricant.

"4. Packing and Date of Delivery.—Each aeroplane entered is to be delivered packed in a strong case or crate suitable for distant transport by rail and sea. The aeroplane is to be complete within the case (except for re-erection from the packed condition) and is to be delivered *on or before July 15th*, 1912, at the Army Aeroplane sheds at Lark Hill, near Amesbury, Wilts. Arrangements will be made by and at the expense of the War Office for the transport of aeroplanes from Amesbury Station to Lark Hill if desired and if notification is received by the Secretary, Judges Committee, *on or before July 1st*.

"7. Notices and Communication with Judges Committee.—Any communication required to be made in connection with this Competition shall be addressed to the Secretary of the Judges Committee (Military Aeroplanes), The War Office, Whitehall, London, S.W., prior to July 1st, 1912, and thereafter at an address to be notified to the competitors by the War Office. All letters relating to the Competition are to be marked on the envelope and on the letter in the left top corner with the words 'Aeroplane Competition, 1912.'

"8. Entries.—Entries will be received by the Secretary of the Judges Committee on or before June 15th, 1912.

"11. Deposit.—Each entrant shall forward with his entry or entries a deposit of £20, returnable after the Competition in the event of the aeroplane or aeroplanes entered by him being duly delivered to take part in the Competition.

"13. Vouchers.—A competitor entering for the United Kingdom Prize shall produce such vouchers, invoices and certified declarations as may be necessary to show that the whole of the various parts constituting the aeroplane, excepting only the engine, have been made and assembled in the United Kingdom."

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The Week's Work.

Monday, May 20th.

Brooklands.—At Sopwith School Mr. Raynham on A.B.C.-Wright with Capts. Alston and Howell.

At Deperdussin School, Mr. Harrison rolling, Lieut. Gill and Mr. Sabelli on racer.

At Bristol School Lieut. Percival, who had been doing good straights, started for first circuit, but in doing first straight got up to 30 ft. or so, and then came down without beginning to flatten out, so crumpled up elevator, chassis, anl left planes, as well as smashing tail booms and propeller. No damage to pilot. Mr. Bettington (the elder) out rolling on Anzani-engined monoplane.

At Herbert Spencer School, Mr. Spencer flying with passengers.

Hendon.—Grahame-White School at work before 4 a.m., Lieut. James making many straight flights on biplane No. 3 and Mr. Hubbard flying circuits; Mr. Lewis Turner also at work testing biplane No. 10, after various adjustments had been carried out and found machine flying much better.

The Plain (Bristol School).—Mr. Fizey first out, taking Major Boyd Moss for tuition, afterwards ascending with Lieuts. Pickles and Wall and Mr. Gutt.

Tuesday, May 21st.

Brooklands.—At Avro School Mr. "Darracq" doing straights, and in evening Messrs. "Darracq" and Rama Smith straights, and Lieut. Parke, R.N., circuits.

At Sopwith School, Mr. Raynham flying with pupils, Capts. Alston and Howell, Messrs. Powell and Hedley—from 7 a.m. to dusk, being in air nearly 5 hours, A.B.C. engine on Wright running faultlessly. Howard Wright "Family Tank" also out, Capt. Alston and Mr. Powell rolling together.

At Deperdussin School, Capt. Dawes rolling an hour and Mr. Harrison half hour. Lieut. Porte, R.N., half hour flying on racer, and Lieut. Gill quarter hour, and in evening Mr. Gill quarter hour and Mr. Sabelli 25 mins.

At Vickers School, Capt. Wood and Mr. MacDonald flying well on No. 5.

At Herbert Spencer School, Mr. Spencer up with passengers.

At Bristol School, biplanes being out of action, Anzani monoplane only machine out. Mr. Arthur rolling, and had one cylinder cut out to prevent lifting from ground—very satisfactory. When rolling piece of loose wire lying on ground caught propeller and broke one tip. New propeller fitted and engine allowed to run full out. He again managed very well, doing several straight hops, but propeller had bad luck to hit a stone, and chipped off end of blade.

Dover.—Signor Nardini on Deperdussin out in evening about 6 p.m. for nearly an hour flying all round neighbouring country and well over Channel. He is advertising a new propeller—a Cyrnos. During day the Belgian, Crombez, was seen on his double Channel non-stop flight; also Mr. Hamel with his passenger on journey from Paris to Eastchurch.

Eastchurch.—Lieut. Spencer Grey out on *Short 34* before breakfast. Capt. Gordon tested Mr. Mortimer Singer's Henry Farman biplane, with wheel controls; Commander Samson flying Short biplane at about 700 ft. In evening Capt. Gordon, Lieuts. Spencer Grey and Malone out passenger carrying on Short biplanes. At 7.55 p.m. Mr. Hamel sighted over sea *en route* from Paris with Miss Trehawke Davies on 70-h.p. Blériot; landed 8 o'clock, having been thrice brought down on the way through thunderstorms.

Hendon.—At Grahame-White School, another full day's work put in from daybreak until dusk. Biplane No. 3 piloted in turn by Lieut. James, Major Liles, and Mr. Kershaw, doing straights, and Mr. Hubbard, Commander Yeats-Brown, and Mr. Roupelle flying circuits. Biplane No. 1, after being tested by Mr. Lewis Turner, Commander Yeats-Brown, Messrs. Gates and Kershaw, and Lieut. James all busy at straight flights and circuits. Mr. Lewis Turner giving passenger flights to two new pupils, Capt. Salmon and Mr. Meredith Wynne on biplane No. 10, and Capt. Nicholas flying straights on monoplane No. 4, and Capt. Salmond first lesson in rolling. In afternoon Mrs. Stocks, Capt. Nicholas, and Mr. Biard at straight flights and Capt. Salmond rolling on monoplane No. 4. Messrs. Manton, Roupell, Commander Yeats-Brown, and Major Liles at circuits and Lieut. James at circuits and figures of eight on biplane No. 3; Mr. Grahame-White on same machine with new pupils, Lieut. Rathborne, as passenger, and afterwards with Master Guy Lewin ("Winkle") in passenger seat. Mr. Lewis Turner very busy on biplane No. 10 with pupils, giving instruction flights to Mr. Wynne and Capt. Salmond, and to various passengers. Messrs. Fowler and Hubbard at circuits and right-hand turns, afterwards flying tests for their brevêt, which they completed in fine style, being observed by Mr. L. Seymour Metford and M. Marcel Desoutter.

At W. H. Ewen School, after trial flight by Marcel Desoutter, new instructor of school, Messrs. James, Apcar, Lawford, Ware, Edmund, Major Skipwith and Capt. Chamier put in good amount of work, rolling and flying, starting at 4 a.m. With breaks only for breakfast and lunch, pupils out all day.

Shoreham.—Mr. England on Collyer-England biplane 5 a.m., early morning.

The Plain (Bristol School).—Mr. Prendergast first pupil up, with Mr. Pizey, who then took up Major Boyd Moss and Lieut. Ercole for tuition on *No. 55*. Mr. Pizey out testing new single-seater monoplane, making two circuits; Mr. Bendall giving tuition to Mr. Prendergast and Major Boyd Moss in getting off and landing. Both pupils ready for solo flying.

Wednesday, May 22nd.

Brooklands.—At Avro School pupils straights on Avro-Green.

At Sopwith School Mr. Raynham with pupils on Wright.

At Deperdussin School, Mr. Harrison rolling on taxi. Capt. Dawes also rolling.

At Bristol School in evening, Mr. Hotchkiss solo to test *No. 26* after re-erection. Then four straights with Lieut. Anderson and two straights with Capt. Becke, this being latter's first flight. Weather bad; no other work possible.

Cardiff.—M. Salmet arrived per Blériot from Bristol.

Eastchurch.—Mr. Hamel started for Hendon on Blériot, with Miss Trehawke Davies, but obliged to return owing to rain at Chatham. Mr. Dunne gave Mr. Hamel a demonstration of automatic stability of Dunne monoplane in a 15-20 m.p.h. wind, and judging from this flight it certainly has what is claimed for it, "automatic stability." Commander Samson, Capt. Gordon, Lieuts. Spencer Grey and Malone all out on Admiralty machines.

Hendon.—At Blériot School, Messrs. Aubert and Pothet on ground 4 a.m., M. Aubert feeling no ill effects from recent unpremeditated *atterrissage*, did couple of straights, and M. Pothet did very good flight across and back. Wind then rising stopped school work until 5 p.m., when Messrs. Aubert, Teulade, and Clappen were all out practising. Mr. Aubert did good straights, and Messrs. Teulade and Clappen did three straights and one straight respectively, when school work was interrupted to enable certificate tests to be flown.

Thursday, May 23rd.

Brooklands.—At Sopwith School, Mr. Raynham out on Howard Wright and blew a cylinder off, and at mid-day on A.B.C.-Wright, but rollers on chain went wrong. Fresh experiences for pupils. Machines ready again for this week.

At Deperdussin School, Capt. Dawes and Lieut. Fox rolling.

At Herbert Spencer School, Mr. Spencer out as usual.

Cardiff.—Very good exhibition flights by M. Salmet on Blériot.

Eastchurch.—No flying; high wind all day.

Hendon.—At Grahame-White School, wind not too favourable, and Mr. Lewis Turner, after making several flights to test wind, decided to devote day to instructions in works.

At W. H. Ewen School, Marcel Desoutter out, but found too much wind for school work.

The Plain (Bristol School).—Mr. Pizey out giving tuition to Messrs. Lister, Featherstone and Lieut. Percival, and afterwards on new monoplane just received from works. Mr. Gordon Bell out testing recently received machine, which was found to be working splendidly. Tricky wind blowing whole morning.

Friday, May 24th.

Brooklands.—At Avro School pupils at work.

At Bristol School, Mr. Hotchkiss solos, wind very bumpy. Then up with Lieut. Anderson twice, Lieut. Holyoake twice, and Capt. Becke once. Last doing excellently in charge of controls.

Eastchurch.—Mr. Hamel and Miss Trehawke Davies left for Hendon on Blériot. Lieut. Spencer Grey out testing new 70-h.p. Short tractor biplane.

Hendon.—At Grahame-White School, Mr. Lewis Turner at instruction flights on biplane No. 10, afterwards taking up three new pupils in the passenger seat, viz., Lieut. Rathborne, Baroness Schenk, and Mr. Scully. Capt. Salmond rolling on monoplane No. 4 and Capt. Nicholas at straight flights. On biplane No. 3 Mr. Manton at circuits and Mr. Kershaw at straight flights.

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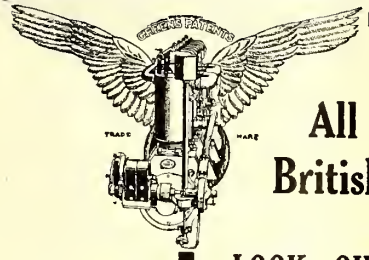

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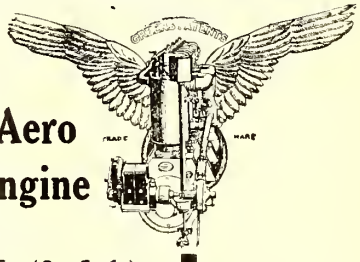

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At Blériot School mechanics very busy tuning up new engine on brevêt machine, which is now flying exceedingly well with Y-type 28-35 Anzani. In evening Mr. Gustav Hamel arrived with Miss Trehawke Davies on new 70-h.p. Blériot tandem two-seater, and did a few circuits round the pylons before landing, which gave an excellent idea of extraordinary speed of machine. Their time from Eastchurch to Hendon was exactly 1 hour, having started at 7.20 p.m.

At W. H. Ewen School pupils out at 4 a.m., but practice delayed for brevêt tests, after which wind got up.

The Plain (Bristol School).—Wind still tricky. Bristol staff out at an early hour, taking nearly all of pupils for tuition flights. Towards evening improvement, and several solos were made.

Swansea.—M. Salmet left Cardiff for Swansea, but missed his way and landed in a marsh, from which he was extricated by the crowd, eventually landing on the sands. Later in the day he made some exhibition flights, and afterwards suffered various attentions at the municipal hands.

Saturday, May 25th.

Brooklands.—Mr. Ronald Kemp out about 6 a.m. on Mr. Ducrocq's old biplane up to 900 ft., and coming all way down in glide with engine stopped. Fine performance for practically first attempt on box-kite.

At Avro School Lieut. Parke, R.N., started for Hendon on monoplane. Engine started missing over Weybridge. Reached big grass field. Landed perfectly. Ran into wire fence, which tripped chassis and turned machine over. Mr. Parke's head saved by helmet, machine not very badly damaged, but one cylinder knocked off engine. In evening Mr. Parke flying Avro-Green, and competing in quick-start competition. Monoplane taken to pieces by four men, and ready for transport back to sheds in 25 mins.

At Sopwith School, Mr. Sopwith and Mr. Raynham flying the old Blondeau-Hewlett biplane in quick-start competition, getting first and second, latter winning after two dead heats. Mr. Sopwith, on Blériot, third.

At Deperdussin School, Capt. Dawes and Mr. Harrison rolling. In evening Lieut. Gill and Lieut. Porte, R.N., in quick-start competition.

At Vickers School, Capt. Wood and Mr. MacDonald doing circuits and eights on No. 5.

At Herbert Spencer School, Mr. Spencer doing circuits, and got third in quick-start competition.

At Bristol School, Mr. Hotchkiss solos, then up with Lieut. Holyoake twice, Capt. Becke twice, and Lieut. Anderson twice. All handling machine and making good progress. Lieut. Anderson rolling. Mr. Arthur did six straights on Anzani monoplane in good style and two circuits in excellent form. In evening tricky wind. Mr. Hotchkiss in quick-start competition, and did some circuits. Mr. Arthur also in quick-start competition. First appearance of a pupil in a competition.

Eastchurch.—Commander Samson out on 70-h.p. tractor; Capt. Gordon, Lieut. Malone, Messrs. McClean, Jezzi, Capt. Carden, and Professor Huntington all putting in good work.

Hendon.—At Grahame-White School Mr. Richard Gates obtained his brevêt, flying all tests in splendid style on biplane No. 10, Mr. Lewis Turner afterwards taking up Messrs. Wynne and Stuart in passenger seat. Messrs. Roupell and Kershaw at circuits on biplane No. 3, whilst Capt. Nicholas and Mrs. Stocks were flying straights on monoplane No. 4 and Capt. Salmond rolling.

At W. H. Ewen School, pupils out again, but little practice owing to further tests and meeting in afternoon.

Blériot School turned up in force at 4.30 a.m., and at 5 o'clock M. Pothet did necessary tests for certificate, flying in excellent style and at average height of 50 ft., making a separate flight for altitude, during which he reached about 300 ft. Tests kindly observed by Messrs. Prenssiell and Desoutter.

The Plain (Bristol School).—Very useful and instructive work done at Bristol schools, in which all pupils took part.

Shoreham.—Mr. England doing straights. Mr. Yates of Eastbourne Aerodrome on Blériot.

Sunday, May 26th.

Brooklands.—At Avro School, Mr. "Charlton" taking first lessons, did appalling helicopt, but kept his head, got tail up, kept engine running, and landed perfectly

At Deperdussin School, Capt. Dawes rolling. Lieut. Porte, R.N., flying new British-built two-seater with 60-h.p. Anzani, first for straights and then doing circuits, machine lifting well and handling nicely. Good start for first British Deperdussin.

At Vickers School, No. 5 going very strong, Capt. Wood doing eights, and Mr. MacDonald over Addlestone and Chertsey, and back by Byfleet, at 700 to 800 ft., finishing with long glide with motor stopped from over Weybridge.

M. Pothet, the latest Blériot pupil to take his certificate.

In afternoon plenty of flying in spite of very nasty wind, uncertain in direction. Mr. Moorhouse first out, on R. and M., up to 1,500 ft., flying excellently. Mr. Hotchkiss on Bristol, with and without passengers, flying in usual able Bristol fashion.

Capt. Wood on *Vickers V.* for short but impressive flight, machine lifting very quickly and apparently very stable, for though she was moving laterally at times, Capt. Wood said he was doing no work and the machine was stabilising herself. Gliding descent from 400 or 500 ft., steady and at good angle. Machine looks very well in air, and in spite of size appears small, which points to proportions being good. Same machine has already done several flights of more than an hour each over Salisbury, so it may be considered a success.

Lieut. Gill on Deperdussin racer, Lieut. Parke, R.N., on Avro-Green, Mr. Sopwith on Blériot and on Blondeau-Hewlett biplane, Mr. Spencer on own biplane, Mr. Raynham also on Blondeau-Hewlett biplane—all flying well.

In landing competition, Mr. Sopwith on Blondeau-Hewlett biplane, with Mrs. Lane as passenger, won with engine 2 ft. from centre of mark, Mr. Raynham on same machine stopping 10 ft. from mark.

In relay race Mr. Sopwith on Blériot and Mr. Spencer on own biplane beat by 19 secs. Mr. Moorhouse on R. and M. and Mr. Hotchkiss on Bristol. Race won by superior speed of 70-h.p. Blériot, as both Messrs. Hotchkiss and Moorhouse landed much closer to the judges than did their rivals, and so had less distance to run to deliver their messages.

Eastchurch.—Mr. McClean out on 70-h.p. tractor in evening.

Hendon.—Large attendance at aerodrome in afternoon to witness varied exhibition flights which took place. Mr. C. Grahame-White put in many flights during afternoon, doing some marvellous "stunts" on Howard Wright. During afternoon Mr. S. F. Cody, on his 60-h.p. Green-engined Cody biplane, flew over from Aldershot and gave some fine exhibitions before descending. Mr. Hucks also gave fine demonstrations on his 50-h.p. Blériot, which he had flown back from Bath on previous evening. Mr. Lewis Turner very busy at exhibition flights and passenger carrying, and Mr. W. H. Ewen flying his wonderful little Caudron biplane.

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At W. H. Ewen School, M. Desoutter out for first time on Caudron biplane, and made capital flight of 20 mins., finishing with splendid *vol plané* from 1,000 ft. and landing perfectly. Thereafter Capt. Chamier and Mr. Apcar flying straights on Caudron. Mr. Ewen put in several exhibition flights.

The Plain (Bristol School).—Mr. Pizey first out, afterwards taking pupils for instruction. Fine solos by several pupils. A number showed themselves ready for certificate tests.

Shoreham.—Boy Scouts experimenting with glider, property of the Brighton-Shoreham Aero Club.

Mr. Hamel's Cross-Channel Service.

Mr. Hamel, with his usual passenger—Miss Trehawke Davies—made his fourth passenger flight across the Channel on Tuesday last, leaving Paris in the early morning on the new Blériot tandem two-seater. They were brought down near Paris by fog, and had to wait there some time before they could go on. Thereafter they reached Hardelot, where they filled up with petrol, and crossed the Channel; but, owing to the approaching darkness, flew to Eastchurch and landed at the Aero Club ground there. Really this cross-Channel flying is becoming quite a habit of Mr. Hamel's. He certainly holds the record as the aviator who has crossed the greatest number of times, this being either his seventh or eighth crossing.

On Friday, Mr. Hamel and Miss Davies flew round North London to Hendon, where they performed some fine flights on Saturday. The machine was taken by road to Coventry on Sunday, and on Whit-Monday they flew again at the Yeomanry Sports at Coombe Abbey.

A First-Class Return.

Quite a good flight was made on Tuesday last by the Belgian Crombez on a Deperdussin. Starting from Nieuport-les-Bains, in Belgium, at 8.50 a.m., he flew along the coast to Calais, from Calais to Dover and back again, alighting at 11.10. Passing over Dover he dropped a note conveying his salutations to "England and her noble King." The *Daily Mail*, ever anxious to advance foreign aviation, makes the statement that "this is the most remarkable oversea flight ever accomplished." As a matter of fact, the distance covered actually over the sea, where the aviator would not alight on land, was the usual Calais-Dover distance of about 22 miles in each direction, the same as that covered by the late the Hon. C. S. Rolls on June 2nd, 1910, and is, therefore, considerably short of the oversea distances covered by Mr. Hewitt, Mr. Corbett-Wilson, and Mr. Loraine in flying to Ireland, M. Salmet in flying from Newhaven to Dieppe, and Lieut. Bague in flying from Nice to the coast of Italy. The *Mail* has also discovered that "M. Crombez has demonstrated the possibility of hostile aeroplanes leaving the Continent, bombarding an English port, and returning to their starting places without difficulty. One might point out that Mr. Rolls demonstrated the converse of this proposition about two years ago, as was pointed out by various journalists at the time.

The Latest Blériot Two-Seater.

The new Blériot two-seater on which Miss Trehawke-Davies and Mr. Hamel flew from Paris to London last week is the finest piece of work yet turned out by the Blériot factory. Though on the usual Blériot lines, it is specially arranged for military work. The passenger is seated behind the wings, where there is practically an uninterrupted field of vision forward under the wings, and from behind the pilot's seat there is a cowl, similar to the one in front, which protects the passenger and yet gives plenty of room for instruments, maps, sketching blocks, and so forth.

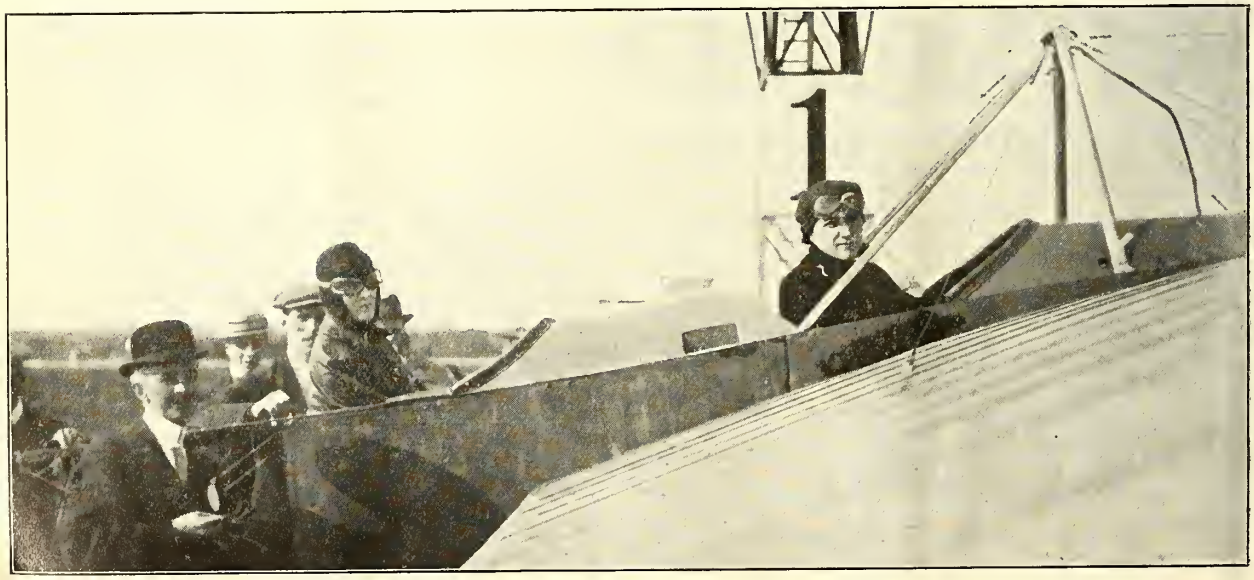
The steel tapes under the wings have been replaced by stout steel cables, and the warping wires are very much stronger than those hitherto fitted. It might, however, be an improvement to double all these wires, just in case a coupling gave way, for stranded cable is apt to be uncertain at the joints. Another innovation is the strengthening of the lower *planche*—the wooden beam running horizontally between the lower ends of the steel uprights of the chassis, where the wing stays are anchored. It is said that a French military aviator was killed recently because, after making a bad landing which cracked the *planche*, he went up again, and at a height of several hundred feet the *planche* gave way and the whole chassis split in two, letting the wings fold upwards. Owing to this, the *planche* has been strengthened with steel strip, and the lower ends of the wing cables are now connected from one side to the other by heavy gauge wire stays.

The whole chassis is lower and stouter than in the older types, but this unfortunately means using a smaller propeller, though this disadvantage could be got over either by using a four-bladed propeller, or by using two geared-down propellers running in opposite directions on the same shaft. There is a big lifting tail, with the elevator along the whole rear edge, and the rudder is "balanced" by having a large portion of its area in front of the rudder-post. Needless to say, the whole machine is excellently finished.

The Aeronautical Society.

Mr. Holt Thomas's lecture on Hydro-aeroplanes—on June 12th, at 8.30 p.m.—will be held, by kind permission, in the Committee Room of the Royal Automobile Club instead of the Royal United Services Institution as previously announced.

There will be an informal meeting at 11, Adam Street, Adelphi, on Monday, June 3, from 5 p.m. Subject: "The Handicapping of Aeroplanes."



Miss Trehawke Davies and Mr. Hamel on the new Blériot Military Two-seater at Hendon. M. Norbert Chéreau, of the Blériot Company, is standing beside the machine, and Mr. Seymour Metford, his assistant-manager, is behind Miss Davies.

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Another important event will be the start of Mr. Robert Slack (an I.C.S. student in Mechanical Engineering) for his aerial tour round the **Circuit of Great Britain**, which will include the chief towns—extending to Edinburgh in the north and Cardiff in the west—1,100 miles.

As showing the keen and practical interest taken by the I.C.S. in the subject, note that on **June 15th, 1912**, various I.C.S. Aviation Events will be held at the **London Aerodrome**, Hendon.

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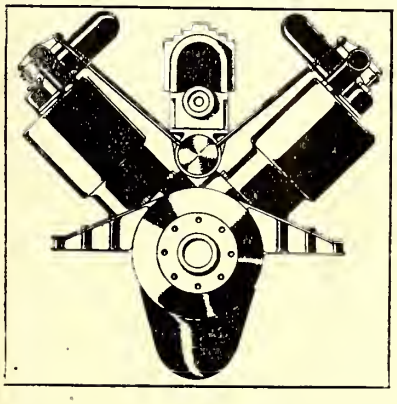

170 H.P. 12 Cylinders—5 × 4¼ in., 390 lbs.
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(Smaller sizes, 60 H.P. and 45 H.P. under construction.)

1911 TYPE

45 H.P. 4 Cylinders 4½ × 4¾ in.—200 lbs.

(A sound, strong engine at a moderate price for school work.)

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The Whitsun Meeting at the London Aerodrome.

Despite quite a nasty east wind, there was some very fine flying at Hendon on Saturday. The start of the cross-country race was postponed for an hour owing to the wind, and for the same cause none of the Brooklands aviators came over, though Lieut. Parke, R.N., very pluckily started on the Avro "cased-in" monoplane, but was forced by engine failure to come down soon after starting, running into a wire fence and smashing the machine in doing so. As a result there were only three starters, Mr. Lewis Turner on the old Howard Wright with a big start, being followed by Mr. Valentine on the Bristol, and Mr. Hamel, with Miss Trehawke Davies as passenger, on the new Blériot two-seater which they had flown over from Eastchurch the previous day. The finish was very close, Mr. Valentine winning by 6 secs. from Mr. Turner, though it looked even less. Mr. Hamel's 70-h.p. Gnôme was running badly, so he scarcely gained anything on Mr. Valentine.

Just before the end of the race Mr. Ewen brought out the little Caudron monoplane, which showed itself as being phenomenally fast, but the engine was not pulling well, so

a flight of the machine at

hands to an ounce, for he judged the descent to inches and made a perfect landing. Mr. Grahame-White had landed the Howard Wright in the same place shortly before, and had received a nasty kick from a gust just as he cleared the sheds, but he also showed just what a landing should be.

The speed handicap was the last event, and gave three fine races. In the first heat Mr. Ewen's Caudron was beaten by Mr. Turner's Howard Wright by only 20 secs., after giving about three-quarters of a lap start in four, and if Mr. Ewen's first three laps had been as fast as his last there would have been a dead heat. In the second, Mr. Hamel and Miss Davies were pulling up slowly on Mr. Valentine, but were beaten by a straight. In the final—of six laps—Mr. Valentine had to give Mr. Turner a lap and a half start. The Bristol was flying magnificently, and Mr. Valentine's banking at the pylons was superb; but Mr. Turner was not wasting a second at the turns, which he was taking quite in the style of Mr. Grahame-White himself, with the result that Mr. Valentine only caught him the second time a quarter of a lap from home. Both aviators were loudly applauded when they descended.

Altogether the meeting was a great success, and the spectators seemed very well pleased with all they saw. Mr. Valentine and his Bristol is now becoming quite a feature at Hendon. When Mr. Ewen's Caudron racer is tuned up, and Mr. Holt Thomas has some of the new Farmans flying, and there are certain new Grahame-White machines finished, and Mr. Sabelli has the little new Deperdussin racer in trim, there will be some very exciting times at the London Aerodrome.

Towards evening it was announced that Mr. Hucks had started from Bath at 6.10 p.m. and might be expected about 8.10 p.m., having the wind against him. However, he did not arrive, and it turned out that he was brought down by lack of petrol near Hanwell.

Whit-Sunday.

There was excellent flying at Hendon on Whit-Sunday, the feature of the day being the arrival of Mr. Cody from Aldershot on his Green-engined "Circuit" biplane. His time, against a stiff head wind, was 1 hr. 8 mins., and he came into the London Aerodrome at a height of 4,850 ft., from which height he did a long, beautifully judged glide.

In the course of the afternoon the Aerial League presented a gold medal to the Green Engine Company for their motor's performance in the Alexander Competition. The presentation was made by General Arbuthnot, who made some pithy remarks on the need for good British engines for war-planes. Incidentally he laid stress on the importance of silence in military aeroplanes. As he was saying so, someone started up a Gnôme in the vicinity, and his speech was suspended till the din subsided, whereupon he remarked that it was obviously not a Green engine, or he would not have been interrupted.

Mr. Fred May, in returning thanks, regretted that though the Alexander Competition was open to the world, none of the foreign entries put in an appearance. He hoped that before long British constructors would cease to go abroad for their engines. He thanked Mr. Cody for his opportune arrival, and for the way he had demonstrated the Green's possibilities. He also pointed to Mr. Cody as an example of what British pluck and endurance could accomplish.

Mr. Cody, proposing a vote of thanks to General Arbuthnot for presiding, said the Green had done him yeoman service in winning the three Michelin Cups, and he was pleased that a new and more powerful Green motor was coming through.

Thereafter Mr. Cody proceeded to do some fancy flying, much to the entertainment of the large crowd present.

As regards the general entertainment, Mr. Turner set the ball rolling at 3 p.m. with a few circuits on the Howard Wright, Mr. Ewen following on the Caudron biplane, Mr. Grahame-White then up on the old Farman. Mr. Noel, the latest acquisition to the school, also did a number of circuits on the Farman, handling the machine well in spite of a 30-35 m.p.h. wind. Both the Farman and Howard Wright were busy at passenger-work practically all the afternoon, Mr. Grahame-White taking Danny Maher, the celebrated jockey, for his first mount on an aerial steed—the Howard Wright. Mr. Hucks was out over the surrounding country.

Whit-Monday.

On Whit-Monday there must have been something like 10,000 people in the enclosures at the London Aerodrome, for the railings were packed five and six deep all the way along, and a lot of people can stand shoulder to shoulder in half a mile. In spite of a dangerously gusty wind blowing from 15 to nearly 30 miles an hour, the Relay Race was got off well to time, and resulted in Mr. Valentine and Mr. Ewen beating Mr. Turner and Mr. Hucks. Abut 4 p.m. the speed handicap was started, Mr. Turner being on limit, and Mr. Valentine on scratch, with Mr. Ewen in between. Mr. Ewen, after two or three laps, was flying low along the railway bank when he was dropped by a gust so that his right wing tip touched ground, and the machine turned a somersault, landing on the upper plane. Mr. Ewen went clean out through the left side of the upper plane, being stunned for the moment, but coming round in a few minutes. The "Warren" helmet he was wearing undoubtedly saved him from a cracked skull, and very possibly from a broken neck. Unfortunately the glass of his goggles cut his right cheek-bone badly and a splinter of the plane laid his cheek open. He was also bruised and cut about the knees, but nothing was broken. A doctor and the ambulance were quickly on the spot. Mr. Ewen's face was stitched up and his wounds generally were dressed, but the doctor, fearing concussion, ordered him to be carried home on a stretcher instead of on a car. As he was carried past the crowd he waved his hand cheerfully, though he could not see, his face being covered with bandages, and he was loudly cheered for his pluck, for he is quite an established favourite at the Aerodrome. We took him straight home and put him to bed, though he was much disappointed at not being allowed to come back and see the rest of the racing. The cause of the accident is not quite clear. Eye-witnesses say that he simply hit a wing-tip and turned over, while others aver that a warping cable broke, though it was pointed out to the writer that two independent cables were fitted, each on a different pulley, and that only one of them was broken. While we were bringing him across the ground, Mr. Grahame-White brought out the Howard Wright and did some very fine flying, to reassure the crowd, which he did with excellent effect.

After some time the Cross-country Race for the Geisler Cup and 100 guineas presented by Mr. Barlow, took place. Mr. Turner, on limit, went the course to St. Albans and back once, but the wind was too much for the old Howard Wright, so he stopped on his return. Mr. Hucks put in a fine chase for the full two laps, after Mr. Valentine and his Bristol, but his engine was not pulling well, while Mr. Valentine's engine and machine were never in such form before, with the result that Mr. Valen-

tine won by more than his start. Although facing quite a strong wind on each outward journey, Mr. Valentine's time was only 52 mins. 20 secs. for the 50 miles, Mr. Hucks' being 54 mins. 9 secs.; not a big gap in such a distance.

In the speed race which closed the meeting Mr. Sabelli, making his first appearance on the new British-built Deperdussin, won the first heat from Mr. Hucks, who put in a fine performance after his engine had refused to start and lost him about a minute. In the second heat Mr. Cody won handsomely from Mr. Turner and Mr. Valentine, the three going round No. 2 pylon in a bunch—Mr. Turner below, Mr. Cody aoove him, and Mr. Valentine higher up on the outside. Mr. Cody had been handicapped on his Michelin Cup speed of 41 m.p.h., but he managed to make a speed of 50 m.p.h. round the pylons, which upset the handicap somewhat; and it is a pity he did not go for the cross-country race, which would have been almost a gift for him. In the final Mr. Sabelli's engine, which was brand new and untuned, started missing at the start, so Mr. Cody flew over alone.

Afterwards there was a lot of passenger-carrying by Mr. Turner. Mr. Grahame-White went up as passenger with Mr. Cody; Mr. Hubert took up the old Farman, and finally Mr. Prenssiell turned a somersault with his Blériot in exactly the same place where Mr. Ewen came down. He was almost unhurt, but the machine was considerably bent.

However, everyone seemed very well pleased, and there was quite a number of people still in the enclosures at 8.30 p.m., when the writer left, which looks as if there was real enthusiasm growing at last. A good many of the uninitiated started off home about 5 p.m., so it would be a good idea if the daily papers could be induced to tell their readers that the best flying is always seen an hour before and an hour after sunset.

Mr. Grahame-White and that astonishing worker, Mr. Richard Gates, are to be heartily congratulated on the success of the meeting and on the way it was run.—C. G. G.

Bank Holiday at Brooklands.

The aeroplane event at the Brooklands Bank Holiday Meeting was a 12-mile cross-country race. Two journeys had to be made from the aerodrome to Chertsey Bridge and back. It was flown in two heats and a final. The first heat was won by Captain Wood on a Vickers monoplane; Messrs. Moorhouse (R. and M. monoplane), Spencer (Spencer biplane), Hotchkiss (Bristol biplane), and Lieut. J. C. Porte (Deperdussin monoplane), also flew. The latter did not finish, landing outside the aerodrome and flying back later in the evening. Mr. Raynham (Burgess-Wright-A.B.C.) won the second heat. Messrs. Pizey (Bristol biplane), Sopwith (Blériot), Bell (Bristol monoplane), and Lieut. Parke (Avro biplane) also flew.

The final fell to Mr. Raynham on the Burgess-Wright biplane, now fitted with an A.B.C. engine. Others in the final were Mr. Pizey (Bristol biplane) second, Mr. Macdonald (Vickers monoplane) third, and Messrs. Spencer, Sopwith, Moorhouse and Bell.

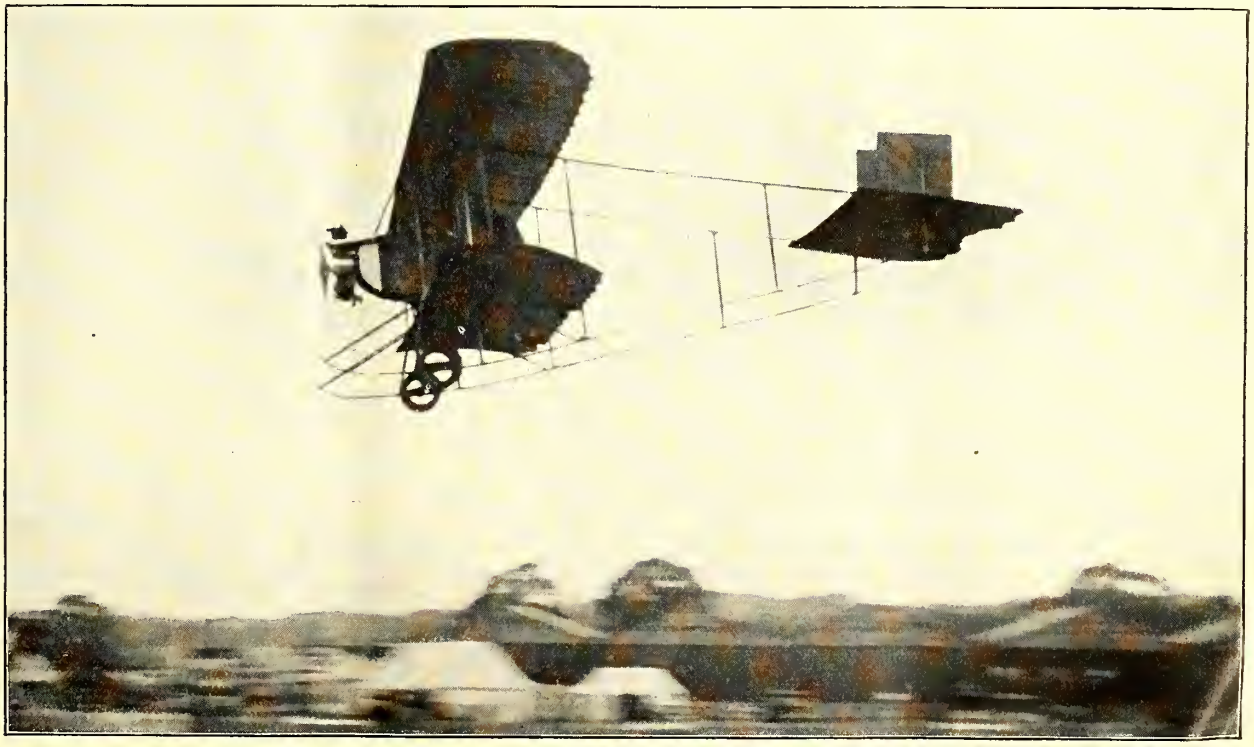
The finishes were excellent, reflecting great credit on Mr. Handasyde's arrangement of the handicaps. Three prizes were given in each heat and in the final. No competitor was permitted to win more than one prize, so that of the ten entrants nine took prizes.

It is to be regretted that the practice of flying low down over crowds is still indulged in. Evidence of this was given more than once during the finish of the different races, the height of the machines above the crowd being not more than 30 ft.

Flying at Bath.

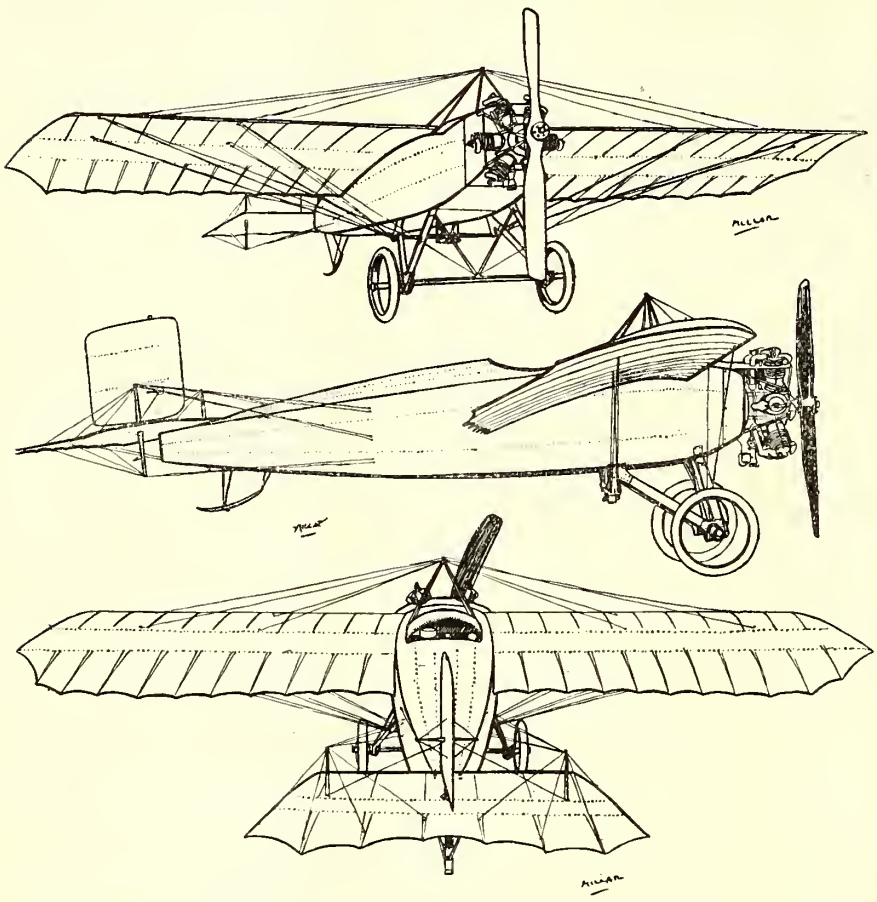
The aeroplane exhibition at Bath was opened on Tuesday last by Mr. B. C. Hucks, who flew on the old Gordon-Bennett Blériot from Hendon to Bath, 106 miles in 2 hrs. 5 mins. against a troublesome breeze. Mr. Hucks carried with him a message from the Lord Mayor of London to the Mayor of Bath, and numerous copies of the *Daily Mirror*, which printed a special edition with Mr. Hucks' portrait on the front. Mr. Hucks, with his usual friendliness to The Aeroplane, posted one of these copies to this office on his arrival.

On the succeeding days some fine flying was done by Mr. Hucks and Mr. Ewen, who had sent the little Caudron down by rail. Mr. Grahame-White also came down, and on Thursday evening put in a flight on the Caudron, with which he seemed very pleased. Mr. Hucks' flying was quite extraordinary, for he turned out again and again in really bad winds, having at times to land down wind at about 80 miles an hour. Mr. Ewen's clever flying was highly appreciated also. Mr. Hucks stayed on a day extra and flew back to London on Saturday, landing at Greenford, where he was most kindly entertained by the farmer on whose field he landed. Some Boy Scouts camping near shifted their camp alongside the machine to act as guards during the night, and next morning Mr. Hucks flew back to Hendon. Mr. Hucks told the writer that all the way back he had quite a good journey, and simply sat watching the country, the most amusing thing being to see the people in the towns and villages come scampering out of their houses and stand still in the road, regardless of traffic, to see the machine.



Mr. W. H. Ewen flying the little Caudron before his smash at Hendon.

The Caudron Monoplane.



Front, side, and rear views of the Caudron Monoplane.

This second outstanding example of Mr. Ewen's enterprise, whose arrival was chronicled a short time ago, has unfortunately not yet been able to show real speed at Hendon, as it was violently eaten by cows within a day or two of its arrival. However, before this unfortunate occurrence, the writer was able to pay a visit to Hendon, and have a careful look at the machine, which is illustrated by a photograph and some sketches. In its general characteristics the machine is like the biplane, except where the alteration of type has absolutely necessitated an alteration of design.

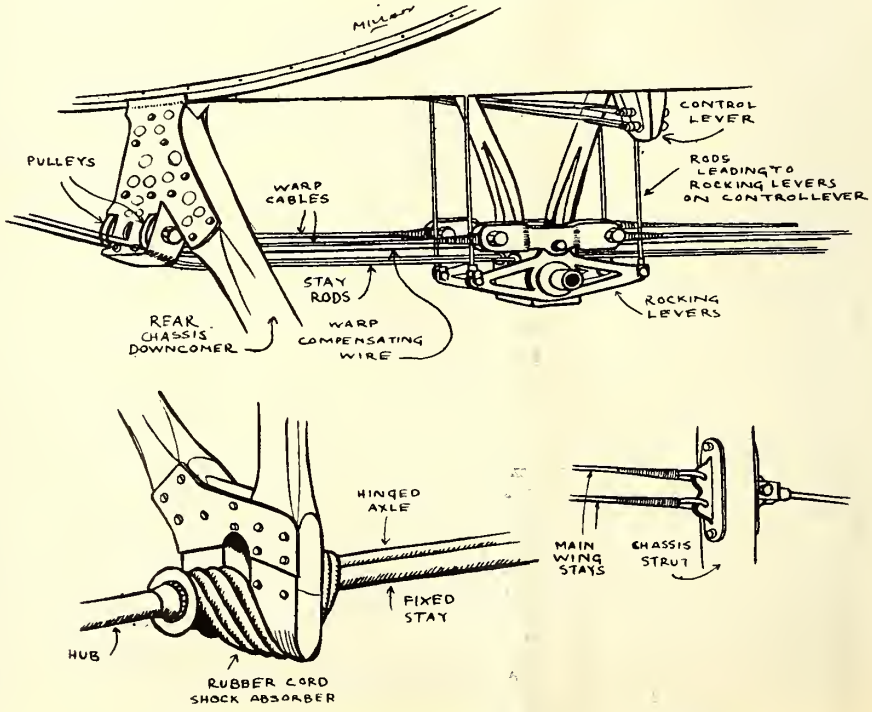
The wings are of 4 ft. 6in. chord, with a total surface of just over 100 sq. ft., which gives some indication of the general minuteness of the machine. There is a spar at the leading edge, and one 18 in. back, the remaining part of the plane being flexible, and the plan-form similar to that of the biplane. The spars are stayed at two points above from a pyramidical cabane, and below from the chassis. The fuselage is square in section, and has a light superstructure which makes it look almost round, this being very light and put on simply in order to avoid edge effects. The engine is fixed outside in front, the top sheet of the fuselage being extended to prevent oil from getting in the pilot's face.

The control planes are similar to those on the biplane, with the exception that only one rudder is fitted. There is a single small tail skid. One of the noticeable points of the machine is the extreme shortness of the fuselage, which is even more marked than in the biplane.

The chassis is very simple, and appears immensely strong. It is shown very well in the photograph and sketches here, where it will be noticed that from points on the bottom edge of the fuselage immediately below the two spars, there run struts which meet at their lower ends, forming horn-blocks to take the hinged wheel axles. There is a fixed and rigid cross strut between these horn-blocks, and from the middle of this cross strut are two struts, going to the junction of the forward wheel struts and the fuselage, the whole chassis structure being thus triangulated and needing no wiring. The wires for the front spars of the wings go to the centre of the front struts, which are in turn tied to the middle of the axle by steel rods.

The power plant comprises a 45-h.p. 6-cylinder Anzani of a new type, having a two-throw crank and offset cylinders. This drives a Caudron propeller of 6 ft. 8 in. diameter (the maximum size which the machine will take). The pilot is seated very low down in the fuselage in a sort of cockpit with a padded top, his instruments being all inside.

The control is by universal lever and foot rudder.



Warping gear, spring arrangement, and wire stay attachments.

The Lubrication of Motors.

One of the most important points about aeroplane engines, and one which is apparently the least carefully studied by the average engine tuner, is the particular kind of oil most suitable for the engine he happens to be using. The average man buys more or less haphazard what he is told is pure castor oil, and evidently imagines that because it is castor oil it must be the right thing; but many others who have studied the question more deeply possess entirely divergent opinions concerning the merits and demerits of castor oil as a lubricant for internal combustion engines. A special study of the subject has been made by the Stern Sonneborn Co., and the writer has had some correspondence with the firm as to the values of various types of oil. The following points will certainly be found of interest.

"In our opinion it would be wise to reject the views of the extremists, whether for or against castor oil. That is to say, whilst recognising that castor oil does present certain advantages, it should also be recognised there are certain drawbacks inherent in this oil, in common with other vegetable oils. Here the question naturally presents itself, 'Is it possible to produce an oil which, while retaining the advantages, gets rid of the disadvantages of pure castor oil?' On this problem our technical and chemical experts have been strenuously engaged for a considerable time, and the results of their endeavours have crystallised in our 'Voltol' aeroplane oils, which we claim have successfully achieved the object in view.

"The most important feature of pure castor oil lies in the fact that its viscosity alters at high temperatures to a considerably less extent than that of pure mineral oil. If, therefore, an oil can be produced with a mineral basis of which the viscosity is not affected by high temperatures to an undue extent as compared with pure castor oil, other things being equal, the oil so produced will combine the advantages of pure mineral oil and pure castor oil, and avoid their disadvantages.

"After lengthy experiments we have succeeded in effecting this purpose by subjecting one of the ingredients composing our 'Voltol' aeroplane oils to a special electrical treatment, as the result of which the 'Voltol' oils, which are frankly compound, do not lose their viscosity to anything like the same extent as pure mineral oils, and in fact in this respect compare favourably with pure castor oil.

"The 'Voltol' aeroplane oils also compare very favourably with castor oil in another direction, namely, price, castor oil being very expensive, whilst the 'Voltol' oils are supplied at a reasonable figure. The 'Voltol' oils are supplied in various consistencies, according as they are to be used on water-cooled or air-cooled engines. Naturally the grade for use on air-cooled engines is considerably thicker than those intended for water-cooled engines.

"As already pointed out, these oils have very high viscosities at high temperature, their other distinguishing features being high flash point, non-tendency to gum, and freedom from carbonisation trouble."

Another most important point in connection with lubricants generally, is whether it is better to feed the engine with exactly the amount of oil it requires, or to fit an auxiliary tank, or sump, containing considerably more oil than the engine is likely to require for a certain journey, and keep on pumping that oil through the engine over and over again.

In the writer's experience of machine-shop work with automatic tools, he has had opportunities of observing a system under which oil is pumped over the works on the machine, and falls with the turnings into a receiver, whence the oil is extracted by centrifugal force and used over again. After being used for a certain period, the oil entirely loses its viscosity and become about as useful for lubricating purposes as plain water.

It seems, therefore, that to a less extent the same thing may hold good where the same oil is used many times over in lubricating the engine. The writer has been in communication with Messrs. James Strang and Sons, the great chemical firm of Glasgow, who specialise on chemicals in connection with such things as soaps, oleines, and oils, and who have been singularly successful in producing lubricants for very high speed internal combustion engines. The firm writes:—

"The essence of lubrication is to interpose between the bearings just enough oil of sufficient fluidity to prevent the bearings from coming together, and at the same time not to interfere with their free working. It is well known to oil experts that the lubricating value of an oil deteriorates by use, and if the method mentioned in your letter, namely, 'pumping the oil through the bearings again and again' be employed, to our mind it would only lead to overheating and carbonising, with all their consequent troubles. We are therefore convinced that the better way is to carry the oil supply in a separate receptacle, and merely feed the engine with sufficient oil for lubrication purposes."

It therefore appears that the most suitable method of lubrication is to keep the engine fed with just enough fresh oil to ensure that it is fully lubricated. Under the other system of keeping the oil circulating it is quite possible that on a really long flight, one might so deteriorate the lubricating qualities of the oil, that though there might be a very large quantity of oil still left in the tank or sump, its effect on the bearings would have so diminished that the engine might seize up very badly.

On the whole the system favoured by Mr. Fred May, of the Green Engine Co., seems to be the most rational, namely, that the pilot himself should have full control of the oil supply, so that when the engine is working under full load, as when climbing, he can give it enough oil to keep it smoking gently, and can cut down the supply when again running with normal load or when descending.

The writer does not pose in any way as an authority on lubrication, and would therefore be glad to have the opinions of both engine constructors and engine tuners on this question, which cannot fail to be of use to everyone handling an aeroplane engine.

C. G. G.

The Latest Avro Product.

One of the most interesting machines yet produced in this country is the new Avro monoplane at Brooklands, which the local humorists have already christened "The Jeweller's Showcase," from the fact that almost the whole front of the machine is covered with non-inflammable celluloid, so that the pilot can see all round him when flying. How long he will continue to do so after the engine is started is rather a moot point, for it seems quite possible that oil thrown off by the propeller and the engine, which is a Viale placed out in front, will obscure the windows in a few minutes; even the casing of the engine itself inside the fuselage will scarcely avoid this, owing to the fact that a certain amount of oil would always work along the shaft, and be thrown back by the propeller.

It should be noted that this machine arrived at Brooklands before the Rumpler machine, which has recently been shown in Berlin, made its first appearance. As a matter of fact, the first idea of boxing in the whole machine which was made public was the drawing on the Bréguet stand at the last Paris show, but the writer understands that Mr. Roe had already a similar idea prior to that date, and, at any rate, he has the credit of being the first to put it into practice. If it should prove ultimately possible to see through the celluloid windows the idea is worth following up, for, at any rate, it would be impossible to be thrown out of the machine in a rough landing, and the pilot would be absolutely sheltered. There is, however, the objection that in the event of a bad smash if the petrol should catch fire it would be most difficult for the pilot to escape from a machine of the entirely closed type. Still, it is undoubtedly a very interesting experiment.

The Newest Flanders Product.

The writer has recently been privileged to see the drawings of the new Flanders tractor biplane, which is at present under construction at the firm's works at Richmond. While in many ways similar to others of the type, the machine contains several novel points which will be well worth seeing. The machine is primarily intended for the use of pupils at the school, so that they may get used to the engine-in-front position before tackling fast monoplanes. A good deal of the machine is already finished, and the workmanship of the parts is quite excellent, as was only to be expected. The firm's new works will permit them to erect four machines at a time without undue crowding, and parts for about a dozen machines can be put through at once, so that before very long we may hope to see quite a number of Flanders machines, both monoplanes and biplanes, taking the air.

The First Europe to Asia Flight.

Mr. Gordon Bell has recently returned from Turkey, where he twice flew across the Bosphorus, and once across the Sea of Marmora, on his R.E.P., so that he is the only aviator at present who has flown from Europe to Asia, as well as the first to make the journey there and back. Since his return Mr. Bell has been flying excellently on a Bristol monoplane, and he will probably fly the new Martin-Handasyde when it is ready.

A Good Beginning.

Those who believe that there is no such thing as a really reliable British engine ought to be fairly well convinced by the performance of the 45-h.p. engine on Mr. Sopwith's Burgess-Wright school biplane. It may be recollected that some weeks ago, while the engine was being tested in the old Hanriot monoplane, it made a number of good flights, including one of 50 minutes non-stop, having previously done a 6-hour full-power bench test, but on Tuesday of last week, under practical working conditions, it altogether eclipsed this performance by doing 5 hours actually in the air, being at work off and on from early morning till 7 p.m. It should also be particularly noted that the engine was running at 1,800 r.p.m. while flying. The machine is now many miles an hour faster than she was with a 50-h.p. Gnôme, is carrying more weight, and yet lifts quite as easily; so that it looks as if the All-British Engine Co. had produced one of the finest engines in the world.

A Neglected Branch of Aeronautics.

Owing presumably to the increasing interest which is being taken in aeroplanes, the dirigible seems to be almost forgotten at present. True, the dirigible in its present state can be of very little use for war purposes; but, at the same time, purely for pleasure purposes, dirigibles of moderate size ought to have great possibilities, and, at any rate, they should be extremely useful in training officers and men in observation from considerable heights before putting them on to aeroplane work. Strangely enough, only one private firm in this country is really making any effort to produce useful dirigibles, and though that firm—E. T. Willows, Ltd.—have had exceedingly bad luck during the past few months owing to trouble with envelopes, nevertheless very good work may be expected from them in the near future. People are apt to forget that one can buy a little dirigible to carry two for about the price of a decent aeroplane, and that afterwards it costs very little more to run.

Mr. Willows' latest effort is a small two-seater, which has already been used with success between Wolverhampton and Birmingham, and he hopes ere long to produce a very much bigger machine which will carry a number of people. It will be remembered that Mr. Willows is the patentee of by far the most successful propeller arrangement for dirigibles, as by his method the machine can be raised or lowered by the propellers alone, without losing gas or ballast.

The Government has certainly expressed very definitely its intention of supporting British aeroplane manufacturers; nothing, however, has been said about manufacturers of dirigibles, but it is just as important that there should be, at any rate, a certain number of people who know something about dirigibles receiving Government support in this country; so it is to be hoped that, under the modern scheme for aerial defence, the claims of E. T. Willows, Ltd., to attention will be recognised.

A Useful Innovation.

The *Daily Mail*, with all its curious ideas on the subject of aviation, certainly deserves every praise for its latest innovation. In the daily weather report may now be found each day a special note for aviators, telling, as near as our present imperfect science can, the state of the atmosphere. It would be interesting if aviators would keep a careful check on these notes, and see how far they are accurate. For instance, on Wednesday last week it was stated "the electrically charged upper atmosphere will be unusually full of air pockets." Unfortunately, it was very windy all day, so presumably there was very little chance of verifying the statement. The move is distinctly one in the right direction.

Another German Accident.

The Germano-Dutch aviator, Fokker, whose novel monoplane was illustrated recently in The Aeroplane, had a bad smash while flying at Johannesthal on Saturday last. His passenger, Lieutenant Schlichtling was killed, but Fokker himself escaped with minor injuries. The accident is reported as being due to a wing breaking, 50 ft. from the ground, after a glide from 1,000 ft. This seems a very likely explanation, for an experienced British aviator told the writer some weeks ago that this machine was, like most German machines, very badly built. Also, it is very short, and consequently very quick longitudinally, the quickness being accentuated by the fact that it has an enormous warping *empennage* instead of an elevator flap, and it has an ordinary engine, so that there is no gyroscope to slow its action. Quickness fore and aft is an immense advantage in cross-country flying where one may have to land in small fields, but it throws greater strains on the wings when flattening out after a glide.

M. Chéreau's "Illness."

M. Norbert Chéreau, the popular manager for the Blériot firm in this country, desires to thank all kind friends for their touching enquiries after his health, following his reported illness. As a matter of fact, he was never better in his life, and his absence from office and aerodrome was due to his being engaged on some important business.

A New Rotary Engine.

The writer has recently been permitted to see the drawings of a new rotary engine recently designed by Mr. Redrup, who will be remembered as producing a somewhat promising rotary some time ago. In the earlier engine two sets of cylinders rotated in opposite directions. In the new engine the ten cylinders rotate in one direction, and the crank shaft in the opposite direction, so that two propellers can be used, revolving in opposite directions at half the speed at which the engine is revolving in relation to the crank shaft. It is claimed for the engine that it gives greater simplicity, accessibility, safety, controllability, silence, and flexibility, with less vibration and expense, than any other rotary engine. Fuller particulars may be had from Mr. S. P. Christie, Redfield Motor and Garage Company, Earl's Court. The engine is distinctly promising, and its claims deserve careful consideration.

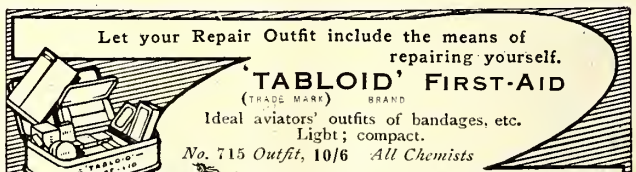
Mr. Grahame-White's New Book.

Mr. Werner Laurie is just publishing "The Aeroplane in War," by Messrs. Grahame-White and Harry Harper, authors of "The Aeroplane Past, Present and Future."

Military aviation is the dominating feature of the flying season of 1912, and the fact lends this book considerable interest. The problems brought about by the use of aeroplanes in warfare are fascinating, and the authors have had one plan always in view in the construction and writing of their book—to extract all that is vital from their subject. The story of the aeroplane is told prior to its first use in manœuvres. Then, in sequence, are described the feats which have demonstrated how military aircraft will influence tactics. To the thinking man of to-day who, reading in his daily paper of the feats of aviators, seeks to be told what the aeroplane can accomplish, the authors make their appeal. The book, which is splendidly illustrated, sells at 12s. 6d. net.

From Theory to Practice.

Readers will be interested to learn that Mr. P. K. Turner, whose technical articles have been a feature of The Aeroplane since its commencement, has joined the staff of the Grahame-White Aviation Company, Ltd., where he will be in charge of the school work. Mr. Turner's articles will still appear periodically in this paper, where his lucid explanations of knotty points have been so much appreciated.



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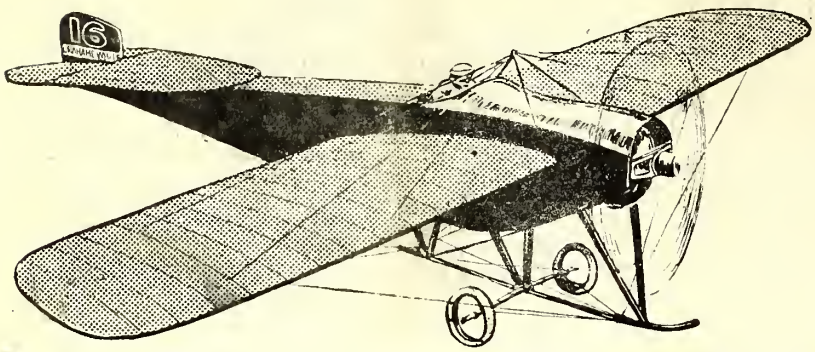

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2. GRAND SPEED HANDICAP.
3. ALTITUDE CONTEST FOR ST. IVEL TROPHY.

FIXTURES.

Saturday, June 15th, Second June Meeting.
Saturday, June 22nd, Second Summer Meeting.
Saturday, June 29th, Midsummer Meeting.
Saturday, July 6th, July Meeting.

Dates to be announced later for

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1d WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

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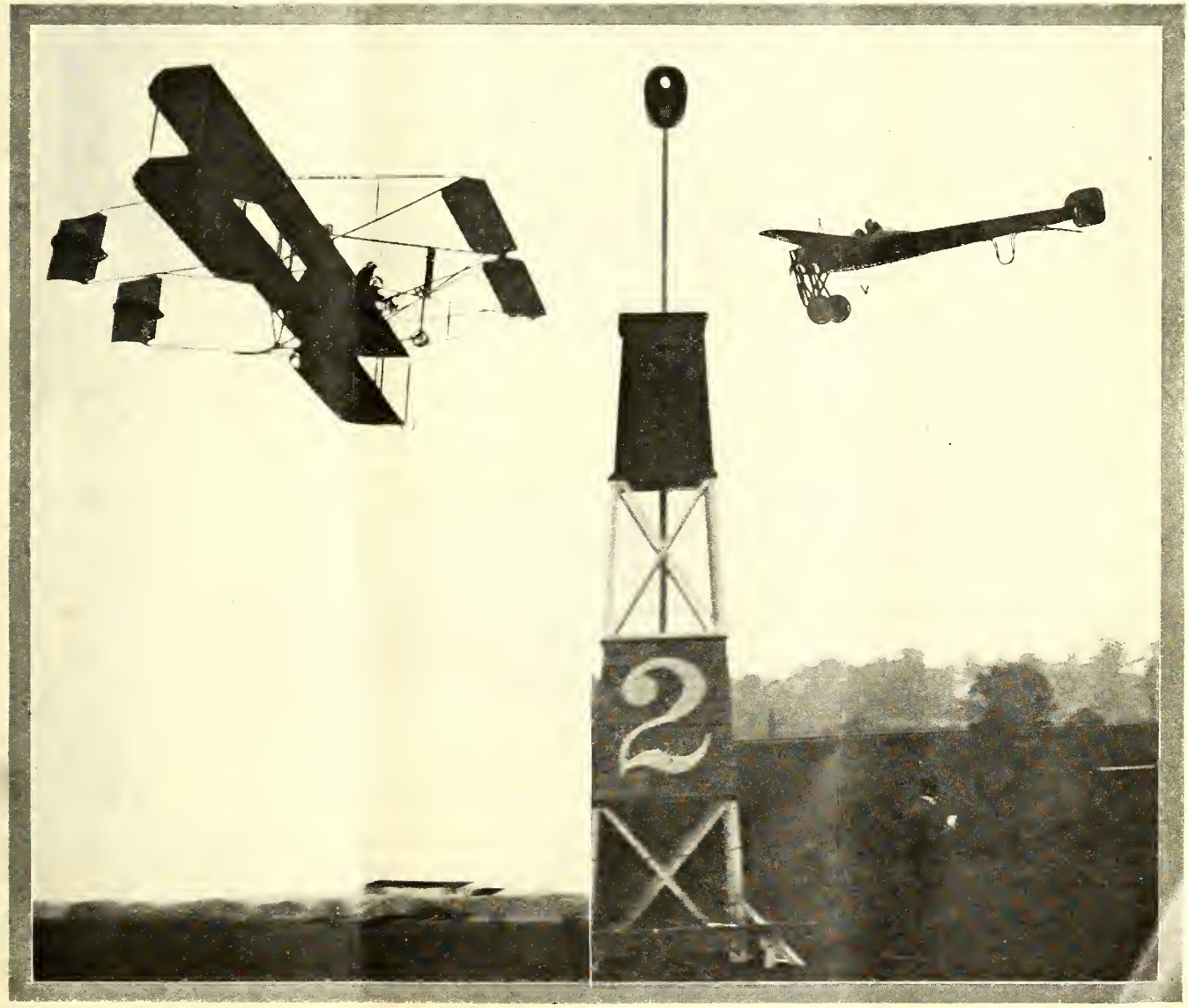
TWO BRITISH COMPETITORS.



On the left Mr. S. F. Cody, taken at Hendon on Whit-Monday, and on the right Mr. W. B. R. Moorhouse, on his R. and M., taken during the cross-country race at Hendon on Saturday last. Both fly British machines, and are likely winners of the Aerial Derby.

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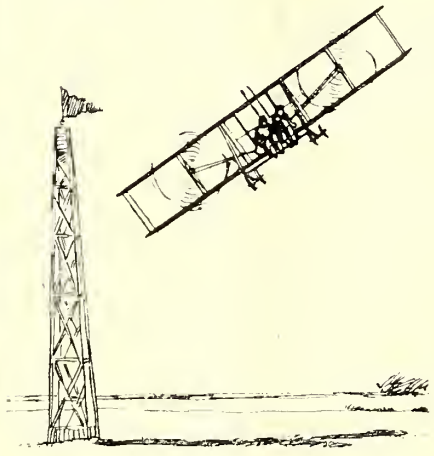

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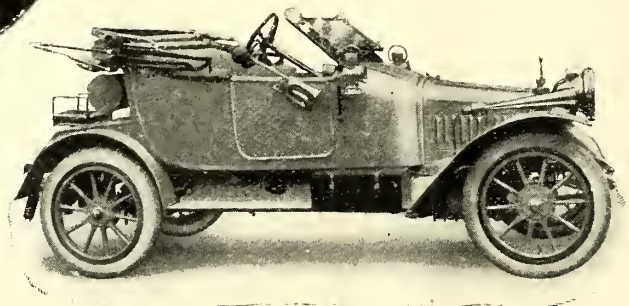

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Editorial and Advertising Office—166, Piccadilly. Telephone—5407 Mayfair. Telegrams—Aileron, London.

MATTERS OF MOMENT.

AERODROME COMPETITIONS.

There has been a good deal of discussion lately among aviators and those interested in aviation as to the best form of competition at aviation meetings. It is, of course, necessary to give the spectators value for their money, or obviously they will not come to see the flying, and then there will be no prizes to win. At the same time everything possible should be done to avoid competitions which are dangerous to the public or the competitors. It is true that if one could guarantee to kill an aviator every Saturday afternoon at any given aerodrome one could be assured of a very regular attendance of spectators —of a sort. But it is equally true that the increasing interest among the better class people is due to the fact that they are gradually realising that flying is a very fine sport, and that the risks are little, if any, greater than those of horse-racing, either on the flat or "'chasing," and if anything rather less than those of motor-racing, judging from the fact that three men have been killed motor-racing at Brooklands, in spite of the fact that the mileage covered by the motors there must obviously be less than the mileage of the aeroplanes, which have caused two deaths. If this good impression is to be maintained one must therefore avoid dangerous competitions. The question is, what is a dangerous competition?

One of our very best fliers argued with the writer the other day that handicap racing round pylons was the most dangerous form of competition one could invent. His argument—quite a sound one—was that in order to ensure a close finish the handicappers were bound to handicap the men as well as the machines. That is to say, if three men got up in a handicap, all on machines of equal speed, and one man was cleverer at banking round corners than another he would be certain to win. In the next race he would have to give the others a start, and to catch them he would not only have to bank more and more steeply at the corners and take more risk of side-slips, but even this risk would be increased by the fact that he would have to fly in their wash when closing up to them, and in order to pass them and win would have to cut his corners closer still so as to spare time to climb over them or go round them. If he still won, he would be put farther back, and would have to take still greater risks till the limit was reached and the inevitable smash came.

This particular aviator advocated as one alternative handicapping solely on the known speeds of machines, but that, of course, is open to the objection that the best flier would win every time, which might suit him very well for a time, but would soon put an end to all racing. He also suggested that there should be more cross-country and altitude flying.

Now here again one is up against just the same trouble. Cross-country racing is all very well, and it is certainly more educative both to pilots and the public than pylon racing, but once one has the same set of men racing against one another day after day the personal element comes in again. At first they start by climbing to 1,000 feet to be safe across rough land. Then someone wins by saving time in climbing, and goes out at 500 feet. Finally the race resolves itself into a tree-top scraping competition.

Altitude is much the same thing. The rivals go higher and higher till the human limit is reached, someone faints in the air, or is frozen so stiff that he cannot control the machine on landing, and there is a smash.

It all comes back to the human element at the finish in all sports. Two men in a point-to-point may both be riding beaten horses; one forces his mount at a fence and breaks his own and the horse's neck, the other knows when he has had enough, and "chucks it." And it is doubtful whether a side-slip from say 30 or 40 feet in an aeroplane is any more likely to kill a man than is a fall of ten feet or so with a thoroughly tired horse, whereas a clean somersault through touching a tree-top is considerably worse than either.

It has been suggested to the writer by a distinguished officer whose experience of all neck-breaking sports is unusually wide—he has won something over a hundred horse races in various parts of the world —that cross-country racing might be freed from tree-top scraping by making a rule that every competitor must leave and enter the aerodrome at not less than 500 feet. At first this seems a useful way out of the trouble, but it is open to the objection that a man with a fast machine which climbs badly would force her up in a dangerous way, and would probably try to do a climbing turn and end in a side-slip and dive, similar to those which have caused so many accidents. Even if one specified that a certain number of laps must be done before going out of the aerodrome, so as to give time for a slow climber to get up, the result would simply be a pylon-shaving competition, as before.

If anyone has any suggestions to make on the subject they will be heartily welcomed, but so far as one can see the actual amount of risk depends on the human factor of safety, which is even less reliable than a mechanical factor. There are risks in all sports. A man may die from overstraining his heart playing tennis; he may fracture his skull

through taking a corner too fast cycling or even skating; he may be killed through trying to tackle too low, or through trying to jump the man who is tackling him at Rugger; the only safety is for each man to know his own limit, and to have the strength of mind not to exceed that limit.

Naturally those responsible for aerodrome competitions are also responsible for seeing that the courses round which men have to fly are as safe as possible. If there is a bad corner it should be eased off, even at the cost of making the course shorter, and the bigger the course and the nearer it approaches a perfect circle the better.

It is true, as the officer already quoted said, that if one man will get up in a race round a bad course, others will follow him, possibly with disastrous results, but the writer's view is that if the course is reasonably safe it is entirely in the rider's or the pilot's own hands whether he competes or not. There are some men who will race round pylons as long as their machines will fly, but who would not risk a cross-country trip on any account. There are others who will fly across country cheerfully in any wind, but who hate pylon racing even in good weather. Therefore the only remedy seems to be for the pilot to please himself and stop on the ground when there is a competition he does not like.

Certainly it is hard for a man with a reputation to uphold to stand down because he knows he cannot win without taking undue risks, and it is really far better for him to do what men in other sports do under similar circumstances, namely, go on competing like a good sportsman, keeping all the time well within his own limits of safety, until such time as the handicappers see that they are giving him too much to do, and either increase his handicap or bring the other men back to him. No one can go on winning race after race, and it speaks well for the handicapping both at Hendon and Brooklands this year that in spite of a wonderfully large number of close finishes the first, second, and third places in the competitions taken as a whole have been distributed among so many aviators. What is wanted to make any form of racing a success are close finishes and a fair distribution of the prizes, and that is one reason why aeroplane racing has been so successful up to the present. The courses at both aerodromes are very fairly safe, compared, say, with Juvisy or Issy in France, and Belmont Park in America, and are certainly vastly more so than those at Lanark, Bournemouth, Blackpool, Doncaster, and Wolverhampton, where meetings were held in the early days when both pilots and machines were less efficient than they are to-day, so no one need take unnecessary risks unless he makes those risks for himself.

Still, if anyone has any ideas for novel, interesting, and useful competitions which are worth watching, and are safer than pylon racing, the smallest suggestions will be thankfully received.

Aviators at Play.

An exceedingly merry performance of the old favourite musical comedy, "Three Little Maids," was given at the Pretoria Hall, Sunbury, by an amateur company last Thursday night, in aid of local charities. The show was organised by Mr. Stanley Adams, and the choir-master, conductor, and general musical director was Mr. R. O. Cary, a well-known and popular member of the Royal Aero Club.

Although a little slow off the mark, as is only natural for a first night performance, the company soon got into their stride, and went very much better than any but the best of professional touring companies. The three little maids themselves were played by Mrs. Cary, Miss Cahill, and Miss Higgins, all of whom did their work excellently. Mrs. Hunter made a beautiful and dignified Lady St. Mallory, and Miss G. Yates, Miss Cross, and Mrs. Hughes did all that there was to do with the "society girls," with the additional advantage that they looked and spoke like girls in good society, and not like dressmakers' models, as the average walking lady does.

Mr. Ronald Charteris (certificated aviator) as Lord Cheyne came very close to Mr. G. P. Huntley, though he would have been even more like him if he had been more like himself. He was quite one of the successes of the evening, and some of his home-made gags were extremely funny. Mr. MacDonald, as Delorme, sang exceedingly well, but could not forget his hands, and Mr. Lewis was quite good as Brian. Mr. Strettell played the father very nicely.

The star turns were undoubtedly Miss Vera Yates as Gretchen, and Mr. Dashwood Lang as Cupid the caddy. Miss Yates was making her first appearance on any stage, but she sang and danced in the best professional style, and reminded one irresistibly of Happy Fanny Fields, she and Mr. Lang singing and dancing "The Barber's Ball" as an Anglo-American-Dutch interpolation not in the original version, quite brought down the house, and, as Mr. Bernard Shaw said when he discovered Miss McCarthy in an amateur company, "It is to be feared that if this young lady continues she will become an actress."

Really the whole performance was much too good to waste on a single evening, and an effort ought to be made, now that the company knows its work, to do the same show again at Weybridge, say, for the benefit of the local hospital.

One of the amusing incidents of the evening was the presentation to Mr. Lang of a handsome bouquet of cabbages by his friends the Brooklands aviators, who had been thoughtfully confined by the management in a special pen labelled "Brooklands Aero Club."

The Possibilities of Flying in the Bermudas.

An experienced aviator who has recently been visiting the Bermuda Islands writes:—"The Islands are not well suited for aviation in some ways as they are very uneven and covered with scrub, chiefly stunted cedar trees, the cultivated land being in small patches.

"On the other hand, there are large stretches of land-locked water which are just the thing for a hydro-aeroplane. There would always be a suitable landing place within a mile on a calm day.

"The season when passenger-carrying would be most likely to pay is from January to March, when the rich Americans are staying in Bermuda. Unfortunately, it is hardly ever calm at that time of the year, so that the pilot must be prepared to make a practice of flying in a wind of 20 or 30 m.p.h.

[Being a sea wind it would probably be fairly steady.—Ed.]

"The Bermuda Legislature is very go-ahead, and seems always ready to spend money to attract visitors to the islands, so I think they would pay a good sum down for exhibition flights, provided they had plenty of time in advance to advertise them in America.

"Motor cars are not allowed on the island, so for this reason also it would be as well to write to the Legislature before bringing an aeroplane to the islands.

"To sum up. Given a suitable machine there is money to be made if the cost of importation is not too heavy."

Another American Fiasco.

Little Mr. Vaniman does not seem to have much luck with his dirigibles. Since Mr. Wellman gave up his attempts on the Atlantic crossing, Mr. Vaniman has found the necessary finance and has been trying to get through on his own account. Last November his dirigible, the *Akron*, fell into a marsh during a trial spin. Since then he has doubled her size, to 400,000 cubic ft. capacity, and on June 1st she was brought out again at Atlantic City only to get her guide rope mixed with a propeller, and take a header into the water, so there will be more waiting for repairs. One might suggest that the American experimenters might engage Mr. E. T. Willows to give them some good advice, as he has covered more miles by dirigible than they have covered feet . . . . . .

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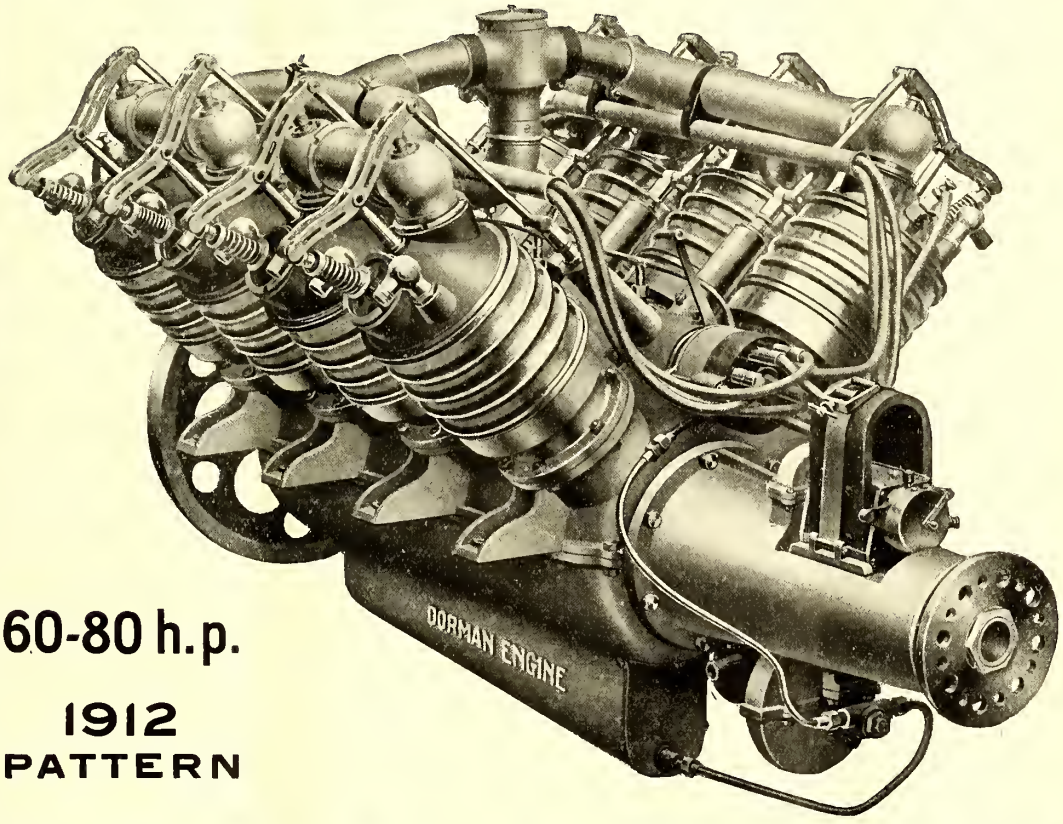

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Observation—*(continued).*

BY W. E. de B. WHITTAKER.

One side of a military aviator's duty has not been touched upon in the different articles on the subject of Service aviation, and that is his uses in the observation of his own side. His investigations of the dispositions of the enemy are obvious and a matter of course, but the other duty is also high in importance. Even in these days of elaborate field telegraphs, telephones, and wireless a general officer commanding is rarely quite clear as to the distribution and positions of his own troops. The field of battle is so large, unforeseen difficulties arise, mistakes are made in the rendering of instructions, and his army is not at an appointed time in the order that it would be if it consisted entirely of soulless automatons. And, however carefully the plans may have been made, there is no certainty that they have been carried out to the letter. The army which most nearly fulfils the plans of a general is victorious. Those on land who might be dispatched to check the positions of an army are limited by their speed and the difficulty of moving over an area congested by large bodies of troops, even though friendly. By the time he returns the face of affairs may have changed and another journey may be necessary. Speed and certainty are essentials. It is therefore clearly within the province of the aerial scout to carry out this form of reconnaissance. He can pass and repass along a front even of fifteen miles in extent in the space of half an hour at the most. If properly instructed he has in front of him a sketch showing the correct desired dispositions of the army, and he has merely to mark on it such variations from the accepted place as there are in actuality. He is but little troubled by the enemy as he operates over friendly territory. It would have helped Napoleon at Waterloo could he have known definitely of Grouchy's disobedience or negligence of his orders, whichever may be the true explanation. Wellington, on the other hand, would have been no worse for accurate knowledge of the movements of Blucher. To know clearly one's own doings is a necessary preliminary to the satisfaction of curiosity as to the enemy's intentions.

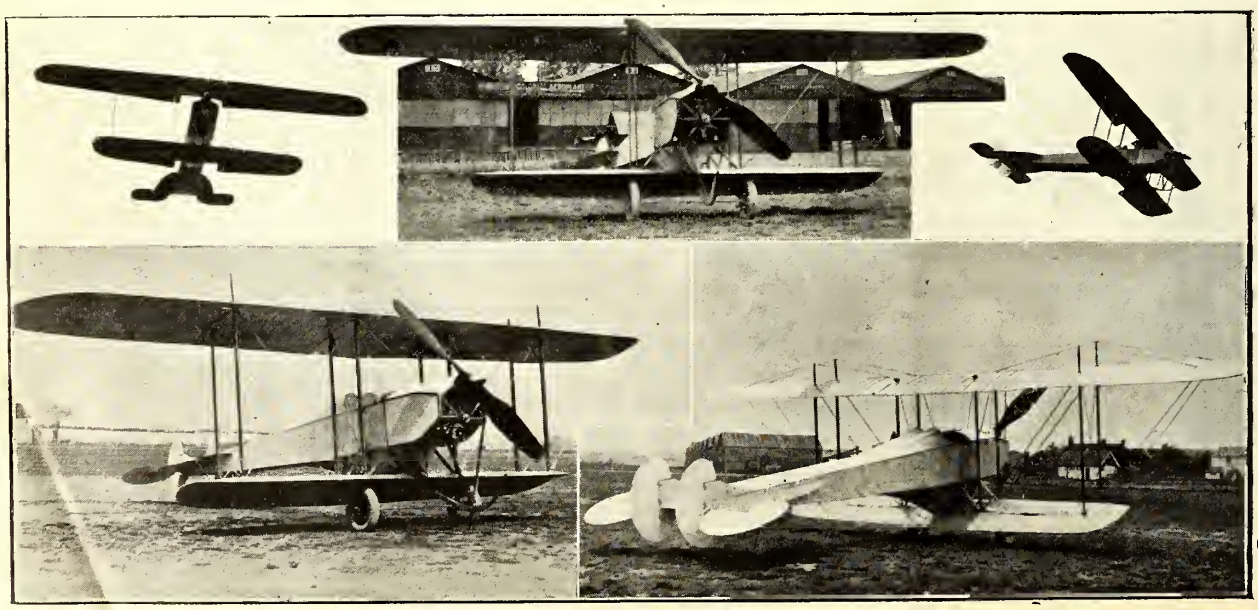
The carrying of messages is also within the province of the military aviator. The aeroplane can travel in an hour a distance which, owing to the nature of the country, would take a mounted man a day to accomplish. He can, moreover, return at an equal speed with a reply, and without being unduly fatigued. The movements of war will be quickened, and a greater precision will dominate the future field of operations. It will be a little less possible to blunder through. Staff work will become, in a sense, more onerous, and a greater devotion to elaborate system will be required. If a general's brain is to stand the strain a larger delegation of duties must be arranged.

The Form of Reports.

The form and contents of reports made by aeroplane observers will differ in many ways from those made by those who carry out reconnaissance on land. There are certain species of information within reach of the one class which are denied to the other, and vice versa. Yet both species are essential. Hence it is desirable that some such rough tabulation of the points required from the aerial scout should be made as is done in the case of him who works on land. I will quote the official view of what points require elucidation in the course of an ordinary reconnaissance. It is laid down in "Field Service Regulations, Part I—Operations. 1909," chap. vi, par. 96, that "I. In reconnoitring a position with a view to attack, information should be obtained on the following points regarding the ground:—

i. The extent of the position.
ii. The weak parts of the position
iii. Any point or points the capture of which will facilitate the development of a searching enfilade or reverse fire against a large extent of the position, and thus render it untenable; and to what extent such point or points have been strengthened.
iv. The best line of attack, and the tactical points of which the possession will favour the development of an effective fire against the weak parts of the position.
v. The locality from which covering fire can be directed."

The first of these can be answered admirably by the aeroplane observer. He sketches the troops on his map, if he possesses one of accurate scale, and measures it up afterwards, putting in rough approximations of the numbers according to his judgment. If he has to make a sketch map he will mark on it as many prominent points as he can discover for later comparison and adjustment with the landscape sketches of the land scouts. It is almost entirely a question of experience. By train-



Various views of the Coventry Ordnance Biplane, taken at Brooklands by Mr. W. O. Manning, the designer of the machine.

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ing and constant practice the number of objects seen and understood can be trebled and quadrupled. In (ii) the observer's opportunities are limited. He knows little of the contours of the country, and he can only make broad distinctions as to the type of ground. It will be readily seen that the strength of a position depends largely on the natural formation of the land. A position on a hill can be held by less men than one in the plains. The observer can only point out weaknesses in the enemy's formation or such strength as is given by the presence of a river in front of the enemy's lines. Railways, high roads, clusters of houses, woods, bracken, and so on can explain much, and the more explicit a scout is on these points the better will his commanding officer be pleased. He can only point out the weaknesses in formation of the troops themselves and trust to the General Staff to make good use of the information. The third point is also largely outside the sphere of the aerial scout. His ordinary report will contain particulars of entrenchments, etc., so far as their plan form is concerned. As regards (iv), he can only convey information as to the tactical disposition of the enemy. He can, of course, do much to direct and, in a sense, control artillery fire. He can show the position of guns and machine guns, the principal fire position, and the situation and approximate strength of the enemy's reserves. No. v only interests him to a limited extent. A brief consideration of the above-mentioned points will show how different in essence aerial scouting is from that on land.

The time at which each observation was made is of great importance in a scout's report. He can trace his track on the map sufficiently accurately to show his point of view. At each occasion that any note is made, or a change of direction, the time should be marked on the report and on the map. Each alteration of altitude should also be stated and the time it was made. Such natural features as he can distinguish should be described. He can say whether a road is metalled or not; he can give the number of tracks on a railway; and he can mark fords through rivers by the simple process of observing tracks leading to the water on both sides. The different types of bridges can be specified, and by deduction their approximate width and length can be stated. Though many apparently obvious objects are distorted or practically invisible to the aviator, certain things are specially clear to him. Water becomes highly transparent from a height of two or three thousand feet, and objects can be clearly discerned on the bed of a river provided the water is reasonably clear. As the Rev. J. M. Bacon found, photographs can be taken of the sea bottom down to a depth of from ten to twenty fathoms if one is at a sufficient altitude. But as experience increases innumerable discoveries will be made into the art of observation, and the aerial scout's duties will proceed on lines laid down by custom.

The report can be written in abbreviated form whilst in the air. It takes but a short time to rewrite and elaborate a statement later, and the few minutes saved in the air means a great deal more than those lost on the ground in the rewriting. Many reports will be purely verbal. It will be only on rare occasions that a scout will be able to devote himself to detailed observation, and in my previous remarks I have endeavoured to suggest points of importance under such conditions. Usually the aerial observer will receive verbal instructions to fly to a certain position and ascertain the enemy's disposition at that point or the true meaning of some unexplained movement. His mode of procedure in such cases is obvious and simple. Fortune is kindest to the general to whom simplicity is a rule. The complication of elaborate system is dear to the heart of the theoretical tactician, but in practice it fails, owing to the fact that on the integrity of each detail depends the success of the whole.

Strategical Reconnaisance.

In strategical reconnaissance the process is again simple. The aeroplane in war, as in daily life, has greatly enlarged the field of action. Whereas of old strategical reconnaissance might extend over a radius of forty miles, nowadays, when squadrons of fast aeroplanes form a highly efficient section of an army, the initial scouting field covers an area of possibly one hundred and fifty miles in extent. The space of time absorbed for survey of the larger area is probably one-tenth of that necessary for even a partial examination of the more restricted field. As this type of reconnaissance takes place before the two opposing armies are in touch, the information required is simple in the extreme. The position and some idea of the numbers of the enemy are desired. Remarks on the country and on formation are unnecessary. This duty, as stated earlier, is within the sphere of the trained observer piloting himself on a fast single-seated aeroplane. Speed is the essence of such scouting.

Transmission of Report.

The aerial scout will, in most cases, deliver his report in person to the Staff, in which case he can supplement it by further verbal amplifications. The clearest of written statements is ambiguous and liable to misconstruction in some portion of it. The personal delivery of reports will take place in future battles under ordinary circumstances where there are enough pilots to carry on the work desired. It will be frequently considered desirable to take messages from aeroplanes which are still in the air. The landing places may not be good and the number of aeroplanes so small that unnecessary risks would be taken and too much time wasted by expecting the scouts to land after each reconnaissance. It would be well, therefore, to devise some system of transmitting news from a flying aeroplane. Wireless telegraphy will, in point of fact, probably settle the difficulty in the best possible way. Messages are now frequently sent by wireless from aeroplanes up to distances of fifty miles and more. Shortly, too, it will be possible to receive messages from the ground with some certainty. This has already been done on a Flanders monoplane at Brooklands, but I have no information as to what state of efficiency has been reached. Apart from wireless, there is no adequate method of sending reports to the ground. Written information can be weighted and dropped in the proximity of the Staff. There is, of course, no certainty of it reaching the right quarter.

Semaphoring has its great difficulties, not insurmountable, but with results hardly equal to the effort expended. The two arms necessary would offer considerable head resistance, and it would be extremely troublesome to arrange suitable fittings that they might be clearly seen from any desired point and so that the wind pressure would not interfere seriously with their operation.

Argentine Military Aviation.

The Argentine Ministry of War have accepted from the Senores Piccardo y Cia a military aeroplane. It is understood that the next estimates will contain provision for the formation of a military aviation corps of which this aeroplane, named the *Argentina*, will be the nucleus.—W. E. de B. W.

French Military Aviation.

Lieutenant-Aviator Gronier, who some months ago had a serious accident while flying at Vincennes, bid farewell to his regiment, the 2nd Cuirassiers, on May 24th. He had hoped that he would recover his former health sufficiently again to join the colours, but Fate willed differently. The 2nd Cuirassiers were formed in a hollow square, with the C.O. and Lieut. Gronier in the centre. His colonel addressed a brief farewell to him, to which he replied touchingly. The regiment then marched past, and he saluted the old standard for the last time.

At the Camp of Mailly, which seems to be the centre of military aviation practice, the training of military observers has been proceeding during the last few weeks. The *chef de bataillon* Duperrier, 79th Infantry, attached General Staff, is director of the course. Lieut.-Aviators Vaudein (commanding), Bordage, Battini and Varcin were the pilots engaged. Sapper

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Brégi was also attached temporarily. The officers undergoing instruction were Captains Boizard (General Staff), Hergault (of General Michel's Staff), Segretin (Staff, 39th Infantry Brigade), Clanet (Staff, 17th Corps), Cordier (Staff, 20th Corps), and Brunet (Staff, 20th Corps). The first part of the course consisted of taking these officers for innumerable flights to familiarise them with the sensation of power-driven flight. The length and height of these flights was increased until officers could make actual observations under the proper conditions. The mean height from which observations were made was 1,000 metres. Careful notes were made of the appearance from above of the different formations of the 6th Division manœuvring below. On several occasions these officer-observer-pupils undertook the control of artillery fire from above and under the best conditions, as Mailly is a gunnery camp.—W. E. de B. W.

Naval Aviation on the East Coast.

It has been stated that Commander Samson, R.N., commanding Naval Wing, Royal Flying Corps, together with Lieut. Spencer Grey, R.N., and Captain Gordon, R.M.L.I., have been inspecting the coast near Harwich with the idea of establishing a naval aviation centre there, and a certain position has already been fixed upon tentatively. This is distinctly a step in the right direction, because it will obviously be necessary to have a regular chain of naval stations along the whole of the East Coast. It was stated in one of the daily papers that when Count Zeppelin arrived at Hamburg with the new Zeppelin he said at the official reception, "This is the threshold from which we enter the sea." It will, therefore, be as well if our naval stations be regarded as a fence beyond which our friends with the dirigibles shall not penetrate.—C. G. G.

Naval Cross-Country Flying.

On Thursday and Friday last some excellent flying was done by the naval aviators at Eastchurch. On the Thursday, Lieut. Malone, R.N., with Leading Seaman Russell as passenger, on a Short biplane, and Lieut. Spencer Grey, R.N., with Lieut. Sheppard, R.N., on the 70-h.p. Short tractor, flew to Margate in the morning and came back in the evening.

On the Friday, the same officers repeated the trip, being accompanied on this occasion by Lieut. Hewlett, R.N., also on a Short biplane. It is particularly worthy of note that all three machines left Eastchurch together on the Friday morning, and landed within 40 feet of one another all inside five minutes, which shows how near we are getting to regular cross-country flights in close company. This is a phase of flying which deserves official attention, for considerable practice will be required on the part of aviators before several machines of differing speeds—as in this case—can be relied upon to depart and arrive together, though for numerous reasons it may be highly desirable that they should do so.

Continental Notes.

It is stated in the French Press that three gallant British aviators intend to fly from England to India in September this year. They speak of flying across the Channel and across France to Vienna. From there they follow the Danube to Nikopoli, through the Chipka Pass, and on to Adrianople. Thence to Constantinople, and then via Tarsus, Adana, Aleppo, and Bagdad, along the Euphrates and the Tigris to Bushire. Here they are to follow the shore of the Persian Gulf to Bander-Abbas, across the Arabian Sea to Karachi. One wishes them every success in their attempt—if it be made.

A flying meeting is to be held at Barcelona from the 8th to the 18th of June. Among the competitors will be Paulhan and Sanchez-Beza on hydro-aeroplanes, and Laurens, Bouvier, Mollien, Barra, Ehrmann, upon Deperdussin, Goupil, Borel, and Farman aeroplanes.

The *Concours de l'Aviette*, for the prize offered by Peugeot Frères for man-driven aeroplanes, held at the *Parc des Princes* cycle track in Paris on Sunday, was an absolute farce, no one succeeding in making even a hop.

The meeting at Johannisthal has, according to *L'Aero*, "been poor in sporting results but rich in accidents." As in America so in Germany, the public instinct is to excess. If genuine sport is lacking, then the contemplation of death by violence has its joys. All nations have their amusements, and Germany is no exception. So far as flying was concerned at Johannisthal, a Herr Abramovitch on a Wright biplane gave a wonderful display.

M. Bathiat, in an endeavour to reach Bordeaux from Mourmelon on a 50-h.p. Sommer monoplane, made a flight of 650 kilometres in one day, landing finally at Angoulême, where unfortunately his chassis was badly damaged in a ditch. His route was by Etampes, Orleans, Chatelherault, and Poitiers. His average flying speed was over 120 kilometres an hour.

M. Charles Nieuport, brother of the late M. Edouard Nieuport, passed the tests for his military brevêt on May 29th. He left Villacoublay at 6 p.m., and flew at a height of 800 metres to Mourmelon, where he landed in the twilight, returning to Villacoublay two days later. This test was carried out on a two-cylinder Nieuport monoplane.

On the afternoon of June 1st, Réby, himself a pilot, was killed when flying as a passenger with Collardeau on a Bréguet biplane. The latter had arrived by air from Velizy in the morning, and had taken up several passengers during the afternoon, and concluded by taking up Réby. The accident happened just as they were landing. A gust caught the machine and it came down heavily on its nose. Réby was killed, whilst Collardeau had a leg broken.—Pingouin Rose.

Public Spirit in Italy.

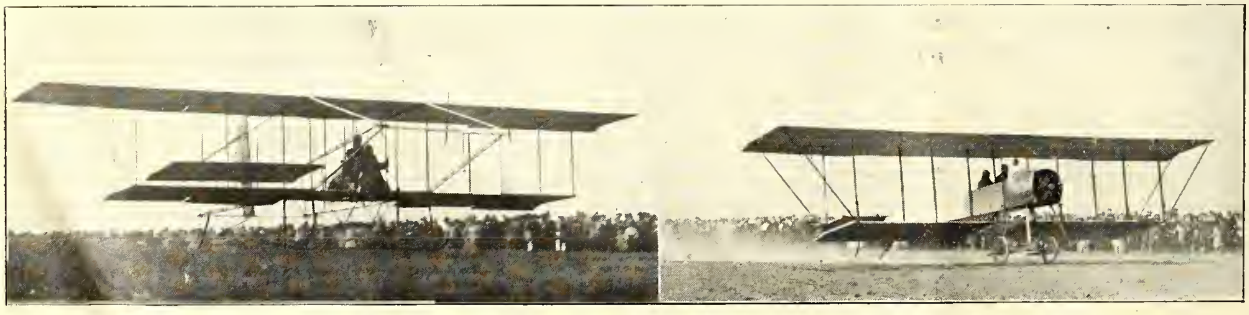
The public subscription for war-planes in Italy has now reached a sum of £80,000, which is enough to buy 100 aeroplanes for the army. This is a fine showing for a poor country like Italy, where appeals have already been made for Red Cross Societies, and for relief for the wounded in Tripoli. Of course, it is easier to raise money when the country is in a state of war fever, and doubtless a much larger sum would be realised under similar conditions in this country, but Italy's present need is nothing like so great as ours would be in time of war, and her sources of supply are not subject to the interferences ours would be, so it is to be hoped that we shall be able to avoid a war till the Royal Flying Corps is properly organised and equipped.

A Good Zeppelin Performance.

On Saturday, June 1st, *Z.3.* arrived at Hamburg from Friedrichshavn at 9.50 a.m., having covered 500 miles in ten hours. She landed at 10.55 a.m. and was housed in the new dirigible "hall" built by the city of Hamburg. Oversea flights are now to be tried, so our North-Eastern ports may have their nights disturbed by unusual sights and sounds.

Another American Fatality.

It is reported that the American aviator Parmalee was killed at Seattle on Saturday, and the same report says that on the previous Thursday he flew into the grand stand, killing two people. Parmalee will be remembered as one of the Wright Company's trick fliers, and as the first aviator to take part in the advertising of goods by delivering a consignment per aeroplane.



Naval Cross-Country Flying.—On left, Lieut. L'Estrange Malone, R.N., with Leading Seaman Russell as passenger, landing at Margate. On right, Lieut. Spencer Grey, R.N., with Lieut. Sheppard, R.N., starting from Margate. Both machines are Short Biplanes.

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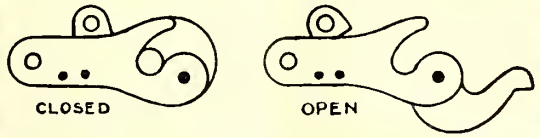

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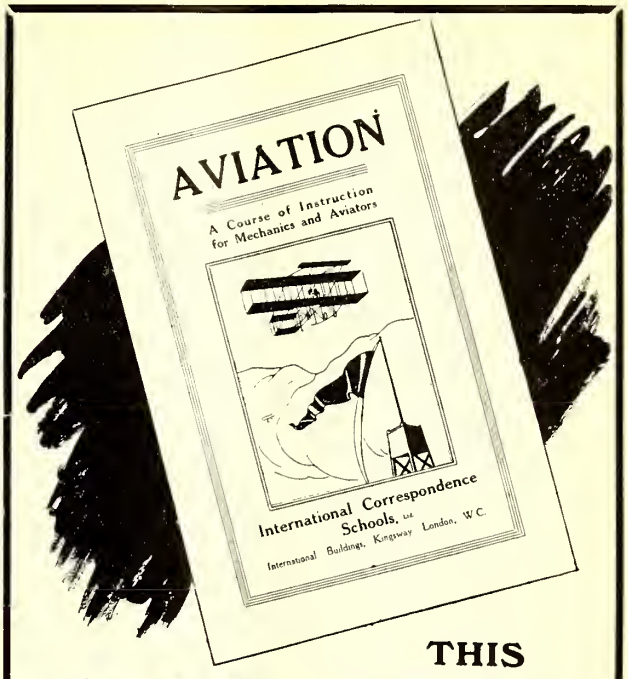

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Wilbur Wright, 1867-1912.

In a science which has so often paid the toll of progress with men's lives it is strange how few of the great ones of the early days of flight have left us. Ader, Maxim, Voisin, Blériot, Farman and Latham are still with us. Ferber and Nieuport have gone, and now Wilbur Wright. The aeroplane has not been deadly to those who brought it into being. Wilbur Wright, in the view of most of us the greatest of them all, died of typhoid at his home at Dayton, on May 30th.

Wilbur Wright was born on April 16th, 1867, the son of Milton Wright, a Bishop of the American Protestant Church. Of his early years there is but little to relate. It differed but little from that of other children. Mature genius does not invariably spring from youthful precocity. He himself traced his interest in aviation to a day in 1878, when his father brought home a toy helicopter which flew successfully. From that time until Otto Lilienthal was killed whilst gliding near Berlin in 1896, Wilbur Wright and his brother Orville took no active part in solving the problem of human flight. They had a profitable cycle business in Ohio, which, as they personally assisted in the manufacture and repair of cycles and motor-cycles, left but little time for scientific investigations into the practically unknown. He said in a lecture some years ago: "My own active interest in aeronautical problems dates back to the death of Lilienthal in 1896. The brief notice of his death which appeared in the telegraphic news at that time aroused a passive interest which had existed from my childhood, and led me to take down from the shelves of our home library a book on 'Animal Mechanism,' by Professor Marey, which I had already read several times. From this I was led to read more modern works, and, as my brother soon became equally interested with myself, we passed from the reading to the thinking, and, finally, to the working stage."

For the next four years they studied all the known authorities on the subject, finally in the summer of 1900 starting actual gliding experiments at Kitty Hawk, on the coast of North Carolina. They followed mainly the principles enunciated by Lilienthal, Pilcher, and Chanute, receiving personal help from the last named, who took a deep interest in their experiments. For three years they took every opportunity of being in the air on a glider, and towards the end of 1903 they constructed their first power-driven aeroplane. Everything on the machine, including the engine, a 16-h.p. four-cylinder petrol motor, was made by the Wrights themselves. With a view to the reduction of weight, the landing chassis consisted of two skids without wheels, and they adopted the starting rail to launch the machine into the air, a device peculiar to the Wrights.

On December 17th, 1903, the first power-driven flights on a heavier-than-air machine were made. The first flight lasted 12 seconds, and the fourth and last day was of 59 seconds, during which the machine covered a distance of 852 yards.

In the beginning of 1904 they left Kitty Hawk and continued their experiments nearer home, at Dayton, Ohio, where on August 26th, a flight of eleven miles was made, followed on succeeding days by many flights of from 12 to 24 miles in length. With this success in hand the two endeavoured to interest the War Departments of the U.S.A. and France in their inventions.

Towards the end of the year a commission visited Dayton on behalf of the French Government under the control of the ill-fated Captain Ferber. Owing to high winds and the innumerable mischances of the early days of aviation, the commission had to leave without having seen a single flight. Such, however, was Captain Ferber's faith in the integrity of the Wrights and in the design of their machine that he strongly recommended his official chiefs to purchase the Continental rights of their aeroplane. Attention was, however, diverted from the American performances by the success of Santos Dumont in France, and nothing was done to acquire the patents. Somewhat discouraged at lack of appreciation and scepticism everywhere, the Wrights discontinued their experiments for many months.

In December, 1907, the War Department, U.S.A., issued specifications for an aeroplane which, if it fulfilled certain exacting tests, would be acquired by the Government. The Wrights entered a biplane for which they asked 25,000 dollars. About the same time they sold their patent rights in France to a private syndicate headed by M. Lazare Weiler, again subject to the successful passing of certain trials. Orville Wright remained in America to carry out the specified flights at Washington, whilst Wilbur went to Auvours, near Le Mans, in August, 1908, to satisfy the requirements of the French syndicate. In both countries they were successful, in America, unfortunately, at the cost of a man's life, and in France after many delays and disappointment.

From that date their success was assured. Rights to build after their model were taken up by firms in England, France, and Germany, and a powerful constructing and financial syndicate was formed in the United States to control the entire aeroplane business of the Wright brothers. A brilliant series of aviators have demonstrated the capabilities of the Wright brothers' inventions all over the world. Tissandier, Etévé, Lefébvre, and Comte de Lambert in France, Rolls, Grace, Ogilvie and Sopwith in England, Engelhardt in Germany, and Hoxsey, Johnstone, Brookins, Parmelee, and many others in America have upheld the *marque*.

Four or five of the Great Powers have Wright aeroplanes in their aerial fleets. Each new move of the Wright brothers was watched with intense interest by all who were concerned in aerodynamics. Even the continuation last year of their early gliding experiments on the coast of Carolina was believed to be the unfolding of some marvellous discovery into the secret of automatic stability. And now the splendid partnership of the two brothers is broken for all time. Whatever may have been the case in reality, Wilbur Wright was dominant in the public eye both as designer and aviator. Orville was overshadowed for some reason. It is curious how much has been done in aviation by brothers, the Voisins, the Farmans, the Nieuports, and the Shorts are other cases in point.

Wilbur Wright was buried on June 1st at Dayton, Ohio. Business ceased in Dayton on that day as a sign of respect to the dead. His memory will not fade to those who knew him in life and the work he began will be carried on to ultimate perfection by hundreds of those to whom he was but a name. The sympathy of the world will be with his family in their sorrow.—W. E. de B. W.

Municipal Engineers at Hendon.

The Institution of Municipal Engineers will visit the London Aerodrome on June 12th, when a paper will be read by Mr. Horace Cubitt, A.R.I.B.A., on "The Structures of the Future in Relation to Aviation," and another by Mr. B. Wyand, Secretary of the Institution, on "Some Suggestions for By-laws and Regulations in Relation to Aviation." Several prominent engineers and aviators have signified their intention of taking part in the discussions. One would like to suggest to Mr. Cubitt that all structures should be in the form of bomb-proof dug-outs, and that the sites of all present cities should be made into level aerodromes, and to Mr. Wyand, that it should be an offence against municipal by-laws for anyone not connected with aviation to be above the ground in city precincts. Special exhibition flights will be given for the benefit of visitors.

Lubrication of Motors.

All modern aero engines are provided with a force pump to circulate oil round the various journals, etc., and the only important difference between the various arrangements consists in the fact that some engines are provided with a sump containing sufficient oil for a long run, while others have only small sumps and require a regular feed of oil from outside at the rate at which the engine consumes oil. In actual practice the first-named method answers admirably, provided the sump is drained completely and refilled at reasonable intervals.

The second method is absolutely unsatisfactory. In England, temperature changes from day to day are sufficient to alter the viscosity of ordinary oils to such an extent that one is continually having to experiment with and readjust the oil-regulating valve, and more trouble is experienced with the oil supply on some engines so fitted than with any other part of the engine.

If any anxiety is felt on the score of loss of lubricative quality of the oil in a large sump, the only proper alternative is to fit the engine with a proper feed pump (in addition to the circulating pump) which will deliver to the engine for each revolution a definite and proper amount of oil to make up for that lost.

It cannot be sufficiently impressed on engine-makers that it is their business to supply their engines in a complete state, so that they have only to couple up through adequate supply pipes to the oil and fuel tanks, leaving the aeroplane builder under no necessity to fiddle about making experimental adjustments before they will run satisfactorily.—W. H. Sayers.

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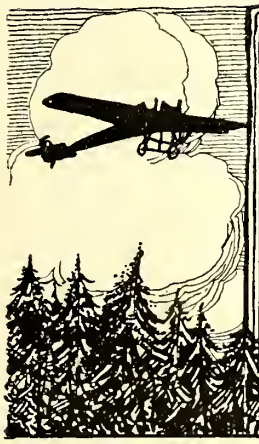

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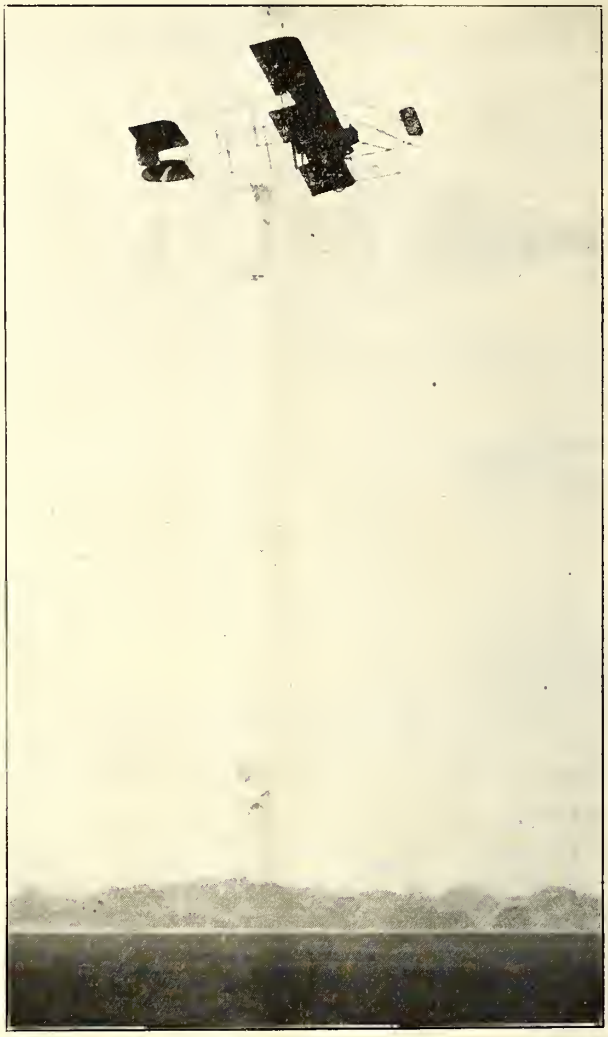
The First June Meeting.

Despite wind and rain there was some very fine flying at Hendon on Saturday last, the feature of the day being the magnificent performance of M. Verrier on the Aircraft Company's Maurice Farman biplane. The first event was a cross-country race to the Hermitage and back twice, about 18 miles in all. The winner was Mr. Hamel on the 50-h.p. Blériot which he flew over from Hardelot on Thursday. His time was 29 mins. 49 secs. from scratch. Mr. Lewis Turner on the old Howard Wright, with 9 mins. 37 secs. start, was second, in 30 mins., and Mr. Moorhouse, who had flown over from Huntingdon in the morning, was third in 32 mins. 20 secs., with 1 min. 17 secs. start.

While the three were out across country, M. Verrier, who had already in the morning taken up Mr. Holt Thomas and Mr. Clement Greswell, the new manager of the Aircraft Company, as passengers, went up alone to about 1,000 ft., and proceeded to throttle down his engine till it was barely turning round. The resulting glide was the most extraordinary thing I have ever seen. There was apparently about a 25 m.p.h. wind, and the big biplane seemed to stand absolutely still, making practically no headway over the ground, and descending very, very slowly on a level keel almost vertically. After covering the width of the narrow end of the ground in the course of some minutes, M. Verrier put her nose down, got the engine going and came round the course, landing in the most perfect style. Afterwards M. Verrier took up, as his first passenger, my esteemed colleague Mr. Whittaker, who does not share my personal views on engine position, and did a couple of circuits with beautifully banked corners. The passenger was quite enthusiastic when he came down.

I think that here I may be forgiven for explaining that I have always had the highest opinion of the design and construction of the Maurice Farman machines, and have always expressed that opinion. My chief objection to them has been the position of the engine, and I still hold that this same machine, with the engine in front of the pilot, and the propeller where it is now, but driven by a shaft, would be even better as a flier and a safer machine to fly. The front elevator and the big curved skids in front could then be removed without detracting from the safety of the machine, and its already high efficiency would be increased owing to the decreased weight and head resistance, just as a somewhat similar alteration made the Wright machine one of the best fliers in the world. But even as it stands, the machine is a model of detail design and workmanship. One has only to look at the way the struts between the planes are hollowed out and the way the aileron wires are brought round their pulleys on to the sector levers of the ailerons to see that the machine is really thoroughly thought out. Engine position may be, to some people, merely a matter of taste, and if I had to fly a machine with the heavy weights behind me, I would rather fly a Maurice Farman with a Renault than anything else, except perhaps a Cody. To quote *Punch's* classic critique on a certain book, "For those who like this kind of thing, this is exactly the thing they will like."



M. Pierre Verrier's first public appearance at Hendon on the new Maurice Farman, showing the good climbing angle of the machine.

Mr. James Valentine and a couple of his prizes at Hendon on Whit-Monday. The small boy is the son of Colonel H. S. Massey, the indefatigable judge at the Hendon Meetings.

The next event was the speed handicap. In the first heat M. Verrier, making his début round pylons, did 7 mins. 34 secs. against Mr. Hamel's 7 mins. 10 secs., and as he had a minute start he won handsomely. He took his corners in great style, with prettily judged diving banks which few pilots in this country would beat, but as some people seemed to think that no one here can take corners in that way on biplanes, I might point out that I have seen Mr. Sopwith and Mr. Raynham on the Burgess-Wright, and Messrs. Pizey, Fleming, Hotchkiss, Gordon England, Pixton, and Busteed, and the late Mr. Gilmour on Bristols, doing just the same sort of thing, though hampered by having Gnômes gyroscoping behind them all the time. As a matter of fact, though they are only British pilots, it is really placing M. Verrier on a deservedly high level when I say that he is quite in their class.

In the second heat, Mr. Moorhouse, on the R. and M., did the four laps in 7 mins. 12 secs., and just beat Mr. Lewis Turner, who did 10 mins. 2 secs., with 2 mins. 28 secs. start. Mr. Moorhouse does not cut his corners as close as does Mr. Hamel, so his machine must be a shade faster than the Blériot, probably owing to its streamlining.

In the final, of six laps, M. Verrier, with 1 min. 18 secs. start, did 11 mins. 34 4-5 secs., beating Mr. Moorhouse, who did

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10 mins. 37 secs. from scratch. In the last lap but one, M. Verrier flew over the top of No. 6 pylon, so he calmly did a sharp, steeply-banked turn round the pylon, which cost him 35 secs., which he could well afford to lose. His machine apparently does about 55 m.p.h. on the straight, but his laps averaged 1 min. 48 secs., varying from 1 min. 49 secs. to 1 min. 47 secs., which works out at 44.5 m.p.h., so it shows how much time is lost on a small " closed " course, in spite of clever flying.

Proceedings were closed by an altitude contest, Mr. Hamel doing 2,500 ft., and winning the St. Ivel Cup outright. At his maximum point Mr. Hamel's barograph worked loose and jambed between his knee and the *cloche*, causing him to do a sickening dive for a few seconds till he could get it clear. Prior to this, Mr. Hamel had started on the two-seater with Miss Trehawke Davies, but the warp was out of adjustment as the result of quick assembling after the machine's return from Coventry, so the pair came down after flying 100 yards or so. Mr. Moorhouse also went up to about 1,000 ft., but came down owing to the heavy rain.

Next Saturday the Aerial Derby will, of course, provide plenty of excitement, and a number of the best pilots are sure to start if the weather is at all reasonable, but it is to be hoped that readers of The Aeroplane will impress on their friends that flying still depends on weather to a great extent, and that one does not fly in a gale any more than one hunts or plays football in a cast-iron frost, or plays cricket in a deluge.—C. G. G.

The I.C.S. Meeting at Hendon.

From Etampes, *via* Mr. F. J. Hortop, of the International Correspondence Schools, comes word that Mr. Slack, who is to make a demonstration tour of the various centres where I.C.S. branches are established, is doing excellent training spins on his new 50-h.p. Blériot. On most days he has been making trips of 40 or 50 miles at a time, and he has shown wonderful quickness in picking up the knack of handling a fast machine after the slow Anzani school machines. His début in this country as a cross-country flier at the I.C.S. meeting on June 15th will be of considerable interest, and the brothers James, the first of the I.C.S. aviation students to take up flying practically, are making progress which shows that the school's theoretical instruction has been really helpful. There should be a big gathering of I.C.S. students at Hendon on the 15th to see their fellow students distinguish themselves. Mr. Slack's first journey is to be in the direction of Hull, so people along the North Road should get in touch with the nearest I.C.S. branch and make a point of attending the lectures Mr. Slack will give in the course of his journey.

Mr. Robert Slack, the I.C.S. Aerial Demonstrator.

Readers would do well to write to the International Correspondence Schools and get particulars of their methods of tuition by correspondence. They have some excellent courses, and one which would interest many readers is that on Gas Power and Motor Engineering. Mr. Slack, who took a course in mechanical engineering, found the method of I.C.S. tuition a very valuable and useful one.

Mr. Hamel's new mount, on which he will not compete in the Aerial Derby. Taken at Hendon on Saturday.

The General Prospectus issued by the International Correspondence Schools proves very interesting reading, showing the growth of the schools, who now have over 200,000 students throughout the British Empire.

A Carping Critic.

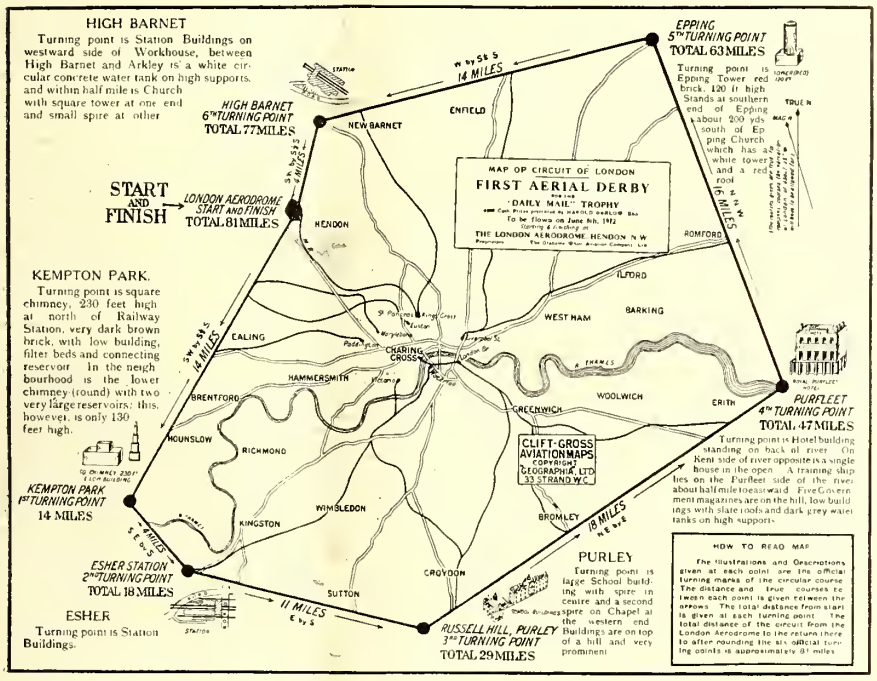
Though it is not usual to pay any attention to anonymous letters, others may be as ignorant as a correspondent signing himself C. S., who writes concerning the flying at Hendon on Whit-Monday: " Seeing that the weather conditions (to my mind) were ideal, I fail to see why the programme was not carried out. Being very interested in aviation, I am a frequent visitor at Hendon, and I regret to say that I was greatly disappointed with the afternoon's performance."

Seeing that the weather conditions included a wind blowing in gusts from 15 to 35 miles per hour, it it is to be feared that what does duty for C. S.'s intelligence must be rather hazy on the subject of " ideal conditions." As a matter of fact the programme was carried out, but it was quite astonishing that any flying at all was done before 6 p.m., and Mr. Ewen's accident was caused solely by the brave way in which the various aviators turned out in order not to disappoint the crowd. If C. S. has the pluck to send his name and address, no doubt it will be possible to arrange for him to go up as a passenger with one of the aviators on a windy day and see how he likes it.

As a matter of fact, there has seldom been a finer race than that between Mr. Turner, Mr. Cody and Mr. Valentine in the speed handicap, and the fact that the engines on Mr. Hucks' and Mr. Sabelli's machines went wrong in the heats was not the fault of either the organisers or handicappers. No doubt it was inconsiderate of Mr. Prenssiell and Mr. Ewen to have their accidents so far away from the crowd, so perhaps aviators in future will endeavour to oblige C. S., and those like him, by providing them with exciting smashes at closer quarters.

The First Aerial Derby.

Of course, the event of next week-end is the first Aerial Derby, arranged by the proprietors of the London Aerodrome. This race covers a circuit of 81 miles round London, the first prize being a trophy presented by the *Daily Mail*, and £250 in cash presented by Mr. Harold Barlow; the second prize is £100, also presented by Mr. Barlow; and the third prize is £50, presented by Mr. Barlow, who thus hands out no less than £400 in one day for the pure love of the sport. The Grahame-White Aviation Co. have also put up £50 for the first biplane to finish, provided it is not in the first three in the race.



Prior to the start of the Aerial Derby, which is booked to go at 4.15 p.m., there is to be a Speed Handicap round the aerodrome for a trophy presented by one of the petrol firms, and a hundred sovereigns in cash prizes. It is an excellent idea having the speed handicap before the "Circuit of London," because if it happens to be windy during the afternoon it may be quite possible to hold the speed event and so keep the crowd interested until the wind drops sufficiently to permit of the start of the big cross-country race.

The accompanying map gives an excellent idea of the course to be followed, and it is fairly certain that, at any rate, at the turning point, the aviators will come down fairly low to make sure that they are turning at the right place, so that the turning points themselves should be good places from which to view the race.

Of course the best thing, from the aviator's point of view, to mark the turning place would be a large smoke fire, as that could be seen from above very much better than even chimneys or large buildings, so that if any local enthusiasts feel inclined to help, and can obtain permission from the local farmers to light fires on their fields, they can be rendering practical assistance to the sport, and THE AEROPLANE will be very pleased to hear from anybody who can help in this way.

This is quite the most ambitious event the London Aerodrome people have yet organised, and it is to be hoped that the weather will permit it to have the success it deserves.

The course is over a distance of approximately 81 miles, with six turning points encircling London, the distance of the respective turning points being as follows:—

Turning point—No. 1, Kempton Park; distance from start—14 miles. No. 2, Esher; 18 miles; distance from last point—4 miles. No. 3, Purley; 29 miles; 11 miles. No. 4, Purfleet; 47 miles; 18 miles. No. 5, Epping; 63 miles; 16 miles. No. 6, High Barnet; 77 miles; 14 miles. No. 7, London Aerodrome, Hendon; 81 miles; 4 miles. Total distance 81 miles.

The turning points are marked as follows:—I, at Kempton Park—square chimney (230 ft. high); II, at Esher—railway station buildings; III, at Purley—school buildings; IV, at Purfleet—Royal Purfleet Hotel building; V, at Epping—redbrick tower (120 ft); VI, at High Barnet—station buildings.

A full description and illustration of each turning point is given on the map of the course herewith.

The following crack fliers are almost certain starters:—Messrs. Hucks (Nieuport or Blériot mono.), Cody (Cody bi.), Sopwith (Blériot mono.), Hamel (Blériot mono), Nardini (Deperdussin mono.), Barrère (Sanchez-Bésa bi.), Moineau (Bréguet bi.), Moorhouse (R. and M. mono.), Valentine (Bristol mono.), Sippe (Hanriot mono.), Turner (Howard-Wright bi.), Guillaux (Caudron mono.), Verrier (Maurice Farman bi.), Lawrence (Blackburn mono.), and Raynham (Burgess-Wright bo.).

Mr. Sippe's Fine Attempt.

Mr. Sydney Sippe, already well known for his fine flying of the Avro hydro-aeroplane at Barrow-in-Furness, made a plucky attempt to fly the new Hanriot monoplane from Reims to Brooklands on Thursday.

Writing to Mr. Ducrocq the day after the flight, Mr. Sippe says:—"First of all I will tell you the damage. The front engine bearer is slightly bent, motor is as far as I have seen absolutely undamaged, the cowl is bent where it touched the ground. This is the complete list, I am glad to say.

"I started from Reims at 3.30 a.m. exactly by my watch at a height of 500 metres, with Regy propeller. At Laon I was going well, and at a height of 800 metres; left Laon 3.50. There was a slight mist, but I could follow easily the railway, and this I did until I was about 10 miles from Amiens. There I ran into a dense bank of fog, presumably from the river, and did not see land until I landed at 5.30. During this time I steered by compass.

"About 5.10 the motor developed a great vibration, causing the compass pointer to jump about violently. At the same time the revolutions as recorded by the counter sank to 900, then 850, the machine dropping from 800 metres to 400. I thought I must, by the time elapsed, be somewhere near Abbeville, so I gradually worked my way along until I saw a cluster of houses and a church through the fog. I then shut off my engine and *vol planéd* down to about 200 ft. to look for a landing place. I switched on my engine and the only result was a splutter. I tried all I knew to coax the engine to go, but no use. I narrowly missed some trees, and made a perfect landing, by the grace of God, on some harrowed land, ran a few yards, then into corn 5 ft. high, and turned completely over, but very gently; the machine was resting on the cabane and I was gently emptied out on to the ground. The motor had by this time almost stopped turning, so that the propeller is without a scratch. The distance from touching the ground to the corn is approximately 100 ft."

The machine was sent back to Reims to be re-adjusted for the Aerial Derby on Saturday.

"Our Idle Rich."

There seems to be an impression in some quarters that the position of committee man on the Royal Aero Club is somewhat of a sinecure. Here is a sample of a day's work by one committee man, at any rate. A committee meeting started at 5 p.m. and lasted till 7.30 p.m.; sub-committee 8.30 p.m. to 11.30 p.m.; thereafter a drive of 100 miles per car, in the rain all the way, followed by 3 hours' sleep, and then up early in the morning to get certain information for the Aero Club's benefit; back to town again in the course of the day, and then a continuation of the sub-committee from 8.30 p.m. to 11.30 p.m. again. Would that there were a few more such workers outside of the Club!

The Week's Work.

Whit-Monday, May 27th.

Brooklands.—At Bristol School, Mr. Hotchkiss and Mr. Pizey for cross-country race. Mr. Gordon Bell also for cross-country race. Mr. Arthur on monoplane after racing over, making excellent progress, flying circuits for 20 mins. right and left. In early morning Mr. Hotchkiss up with Capt. Becke, and latter rolling. Then Mr. Hotchkiss with Mr. Holyoake.

At Vickers School, Mr. Macdonald out early on *Vickers No. 5*, machine now flying in excellent style.

At Deperdussin School, Mr. Kooloven out early doing straights on racer.

At Avro School, Lieut. Parke, R.N., out about 4.30 p.m. on Avro-Green biplane in gusty wind. In evening, after racing, Messrs. "Darracq" and "Charlton" straights on school machine.

At Sopwith School, Capts. Alston and Howell out with Mr. Raynham on school Farman, and several passenger flights were given by Mr. Sopwith on Blériot.

Mr. Moorhouse at midday made one of his characteristic flights under very trying conditions, while later, after the racing, Mr. Kemp, on Mr. Ducrocq's Farman, made several pretty exhibition flights.

Racing results published last week.

Eastchurch.—Lieut. Gregory, R.N., out in afternoon on Short biplane, flying exceedingly well at a height of some 1,400 ft. Capt. Gordon, R.M.L.I., on biplane with passenger. Mr. McClean out on 70-h.p. tractor.

Filey.—Mr. Brereton out giving further exhibition flights, and made some fine circuits over the Bay doing figure 8's over sea. Later several passengers were taken.

Hendon.—In morning, calm weather, so Grahame-White pupils out for monoplane practice. Mrs. Stocks and Capt. Salmond busy from 5.45 a.m., both doing well on 25-h.p. machine. In evening, too gusty for school work. Highly successful meeting in afternoon, fully reported last week.

Llanelly.—M. Salmet arrived on Blériot. About 2,000 people paid to enter ground, and an estimated 198,000 had free "hedge-tickets." Sporting place Lalnelly!

The Plain (Royal Flying Corps).—Lieut. Conner and Staff-Sergt. Wilson out on *F.8.* doing solos. Cpl. Ridd took *F.7.* out, and did some very good flying, coming down from a good height.

The Plain (Bristol School).—Mr. Bendall first up giving two tuition flights to Messrs. Lister and Featherstone. Good solos made by Lieut. Pickles. Mr. Prendergast showed great promise in solo, whilst Lieut. Percival also made two good solos, landing well. Capt. Allen made two trips on a school monoplane, but landed rather heavily each time. Rising wind prevented further flying.

Tuesday, May 28th.

Brooklands.—At Bristol School, Mr. Hotchkiss up with Mr. Holyoake, and later with Mr. Lane and Mr. Bettington. Capt. Becke out rolling, while doing so Deperdussin taxi landed in front of him, and though never off ground before, he lifted the machine clean over the Dep. and landed without any damage, so saving a very ugly smash.

At Avro School, early, Lieut. Parke, R.N., solo air testing on school biplane, followed by Mr. "Charlton" doing excellent straights and "Darracq" rolling. In evening, Lieut. Atkinson, R.F.A., out for first lesson, progressing quickly to excellent straight flights. Messrs. "Charlton" and "Darracq" also out.

At Deperdussin School, Lieut. Gill out early on racer for 20 mins., Lieut. Fox and Mr. Harrison rolling. In evening, Lieut. Fox flying circuits on racer, while Lieut. Porte, R.N., flew for several minutes on new two-seater.

At Sopwith School, school biplane busy morning and evening, Capt. Alston and Messrs. Herbert and Hedley receiving instruction.

Eastchurch.—Capt. Gordon, R.M.L.I., flying passenger Farman in which he took up several passengers, including his sister, Miss Gordon, who expressed great pleasure with her first flight. Other passengers included Lieuts. Courtney and Sheppard. Capt. Gordon's knack of landing makes one quite envious.

Filey.—Mr. Brereton again out doing excellent flights. Mr. Scott also out doing straights, flying very steadily and landing with ease.

Hendon.—Another calm morning and evening, and a good day's school work. In all, 28 lessons given, work continuing from 3.15 to 6.4 a.m., and 4.30 to 8.30 p.m. Mr. Lewis Turner up with Capt. Salmond and Madame La Baronne Schenck as passengers on Howard Wright, and Mr. Noel giving instruction on Farman to Messrs. Roupell, Manton, and Kershaw, while Mrs. Stocks and Capts. Salmond and Nicolas practised on 25-h.p. Blériot. Morning's work finished by latter, who (with assistance of pupil of another school) succeeded in smashing two 25-h.p. Blériots in collision. In afternoon, Messrs. Wynne, Rathborne, and Scully rolling, Messrs. Kershaw and Morris doing straights, and Mr. Manton circuits, all on school 'bus, the Howard Wright being in dry-dock owing to engine trouble.

At Blériot Shool, many pupils at aerodrome by 5 a.m., but owing to heavy ground mist impossible to commence school work until 6 o'clock, when weather was perfect until 6.45, during which time, M. Aubert, who is coming on quite well, flew four straights.

At W. H. Ewen School, Messrs. Apcar, Edmunds, James Brothers, Capt. Chamier, and Major Skipwith, all put in excellent rolling practice and straight flights.

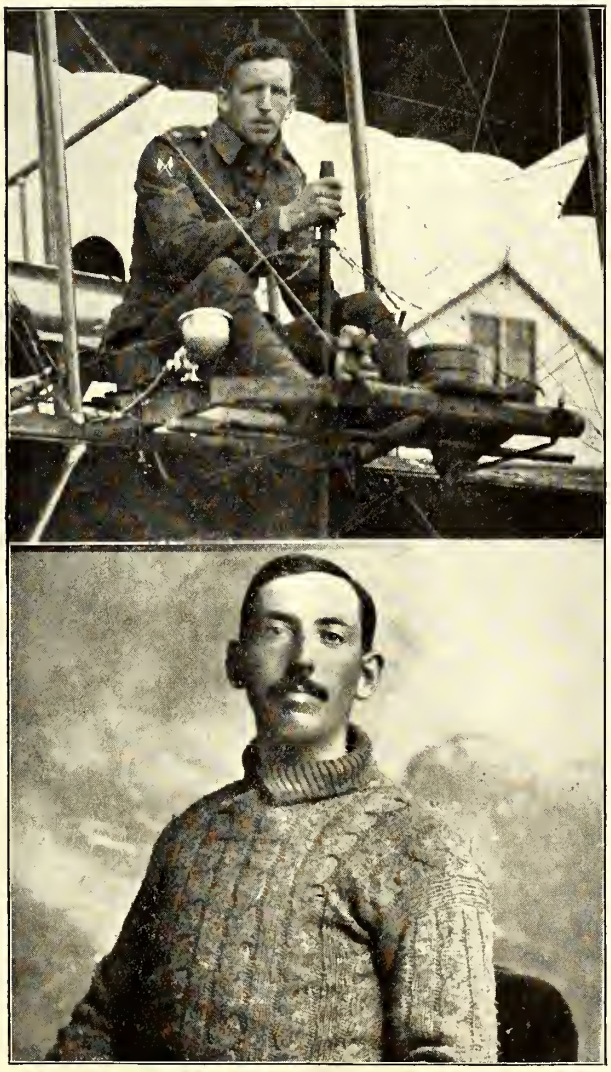
Rhyl.—Mr. Vivian Hewitt up on 50-h.p. Blériot for 40 mins. Leaving the aerodrome at 7.30 in the evening, he flew over Promenade at 1,500 ft. Had very exciting race with express train as far as Prestatyn, about five miles distant, and easily beat it. Mr. Hewitt was testing a new *cabane* which had been made in own workshop, and found it highly satisfactory. Promenade black with people, being Whit-week, and Mr. Hewitt had great sport flying round excursion steamers. One

Mr. H. Salmet sends greetings from South Wales.

learns that a movement is on foot to present him with a silver cup in commemoration of his Irish flight, and about time, too. Both Mr. Hewitt and Mr. Corbett-Wilson thoroughly deserve some recognition for their daring feats.

The Plain (Royal Flying Corps).—Lieut. Conner and Staff-Sergt. Wilson out on *F.8* in morning, and Cpl. Ridd out on *F.7*. In evening Lieuts. Conner and Porter flying *F.8*. and *F.7*., later Cpl. Ridd and Staff-Sergt. Wilson taking them out. Capt. Fulton came down on flying visit, and took *F.8*. out for a short trip, taking passenger with him. Lieut. Conner took passenger also. In evening Cpl. Ridd went for his certificate. He is thus the first non-commisioned officer of the British Navy or Army to obtain his brevêt. He was only under tuition for about a week, and had only flown about six times. This non-commissioned officer accompanied Lieut. Barrington-Kennett on his flight for the Mortimer Singer Army Prize, when they broke the world's record for a flight with a passenger on February 14th last, flying for 4 hrs. 51 mins., and covering 248½ miles, thereby winning the prize of £500. Cpl. Ridd has makings of a good flier, and should prove a credit to his instructor, Lieut. Barrington-Kennett.

The Plain (Bristol School).—Mr. Bendall, after a trial of conditions, gave Mr. Lister a tuition flight, pupil taking charge of controls. Lieut. Percival carried out a fine solo, completing figures of eight with good landing. Mr. Prendergast also did well in two flights. Mr. Pizey first out in the evening, taking Mr. Rawson Shaw for about 20 mins., pupil holding the control handle and showing excellent progress. Major Boyd Moss was



The First Non-Commissioned Aviators of the Royal Flying Corps. 2nd Corporal Ridd (above), and Staff-Sergeant Wilson. Corporal Ridd took his certificate on Tuesday last.

then up. Mr. Lister out for useful instruction with Mr. Bendall in getting off and landing. Lieut. Percival passed the tests for certificate in fine style, observed by Lieut. Reynolds and Mr. Smith-Barry. Lieut. Dawes made clever flight on one of the biplanes, and Lieut. Pickles executed pretty solo. Lieut. Hartree, who gained his brevêt at the school a short while back, made a trip on biplane No. 65a. Lieut. Fielding and Mr. Smith-Barry each made short trips on biplane No. 55.

Waterloo (Liverpool).—School closed from Saturday till Tuesday of last week for holidays, during which time Mr. Melly was away at Windermere, and went up in Mr. Wakefield's hydro-aeroplane with Mr. Adams piloting. Experience quite new, as he had never been in a biplane before.

Wednesday, May 29th.

Brooklands.—At Bristol School, Mr. Hotchkiss out at 5.15 a.m. with Mr. Holyoake, then latter in pilot's seat. Capt. Becke doing straights in good style. Mr. Holyoake rolling. Capt. Becke doing half circuits. Mr. Hotchkiss then testing with mechanic Willis to observe engine. In evening, Mr. Hotchkiss solo for the circuit. Then up with Mr. Holyoake for three circuits. Capt. Becke then flew solo two straight lines and afterwards three circuits to left. Mr. Hotchkiss then up with Mr. Wilmer (new pupil) for first flight. Then again with Mr. Holyoake. Capt. Becke three circuits.

At Avro School, early, Lieut. Parke, R.N., solo air testing, followed by "Darracq." In evening, Messrs. "Charlton" and "Darracq" out on school 'bus.

At Deperdussin School, Capt. Dawes and Lieut. Fox out in morning. In evening, Lieut. Fox on racer flying well, and a new pupil on taxi. Proceedings on taxi brought to close by exhaust from engine firing oil in bottom of fuselage. Gratifying promptness in appearanee of fire appliances and no damage to either machine or pilot.

At Sopwith School, early, Capt. Howell and Messrs. Herbert, Hedley and Powell receiving instruction on school Farman, Mr. Hedley taking machine from pilot's seat. In evening, Messrs. Howell, Herbert and Webb-Bowen on school machine. Lady passenger also carried on school Farman by Mr. Sopwith.

At Vickers School, early, Capt. Darbyshire rolling on No. 3. In evening, Capt. Darbyshire making good straights on No. 3.

At Spencer School, Mr. Spencer out afternoon and evening giving instruction to Mr. Lewis Marcus.

Mr. Kemp out early on Mr. Ducrocq's Farman.

Mr. Moorhouse started on R.M. for Kettering, returned shortly, having lost one glass from goggles. Having replaced this he again departed.

Eastchurch.—Lieut. Spencer Grey, R.N., with Lieut. Sheppard as passenger, put in some good work on the new 70-h.p. Short tractor machine *T.5*. Mr. McClean put the new Army Short biplane through its one hour's flight, and then went out on his 70-h.p. tractor for a 32 mins.' flight with Mr. Fowler as passenger. Lieut. Hewlett, R.N., took one of the school biplanes up to about 1,000 ft., being only the second day on which he had been on a Short biplane. Prof. Huntington was out putting in some half-mile straights.

Filey.—Mr. Brereton out at 7 a.m., made 5-mile circuit in Filey Bay and then struck inland with intention of flying to Leeds. At 7.25 he landed at Malton, 22 miles away, owing to slight engine trouble. Motor stopped when he was at 2,000 ft. and he made a very fine glide, landing without mishap.

Freshfield.—Messrs. Fenwick and Swaby flew to Southport on Mersey monoplane, circling the town and finally landing on beach, where machine was promptly surrounded by huge crowd. Incidentally aviators ruined a political meeting, as audience and reporters deserted as soon as it was heard aeroplane was to be seen. Mr. Fenwick took up several passengers for short flights, and then both flew back to Freshfield. Seven miles were covered in 6 mins.

Hendon.—Grahame-White School, in morning, Mr. Noel in passenger seat, teaching control to Messrs. Fuller and Rathborne; Messrs. Kershaw, Morris and Roupell doing circuits on Farman. Mrs. Stocks making excellent circuits on the 35-h.p. Blériot, followed by Capt. Salmond, who had the misfortune to bounce and pancake after a bad landing, completely wrecking front of machine. In evening, nothing till dusk, when Howard Wright out for engine test, after which engine refused to fire till 9.45 p.m. However, a patient passenger had been waiting meanwhile, so Mr. Lewis Turner took him up, petrol being poured on the ground and fired as some sort of a guide to landing, as there was no moon.

At Blériot School, Messrs. Aubert, Hall and Clappen all out practising at 6 a.m., former now having been promoted to brevêt machine, took charge, and going up, found he could not make a comfortable landing until he had done three circuits, having got up to 120 ft. instead of 40 ft. advised. Being quite satisfied with this performance, he thought he would like to repeat it, but went up again and did one circuit at about 40 ft., which he concluded with very nice little *vol plané*. Messrs. Hall and Clappen contented themselves with straights meanwhile, Mr. Hall doing four in flight and Mr. Clappen doing four rolls across and back. In evening, Messrs. Hall, Teulade and Clappen were all out at exercise, Mr. Teulade doing steady straight flights and others doing good straights along ground. Mr. Crawshay out meanwhile on his 50-h.p. Blériot doing a little excursion in Elstree direction at about 3,000 ft. and landing in his usual excellent style with a fine *vol plané* just in front of hangar.

At W. H. Ewen School, all pupils out rolling and put in excellent work.

Taunton.—M. Salmet arrived on Blériot from Llanelly, having flown past Swansea and Port Talbot, and crossed the Bristol Channel to Weston-super-Mare. Local interest in aviation previously aroused by Mr. Hucks' fine flying on Blackburn last autumn, so crowd took intelligent interest in M. Salmet's performance.

The Plain (Royal Flying Corps).—Capt. Loraine out on Deperdussin, and did some excellent flying, coming down with spiral gide. A passenger accompanied Capt. Loraine on next trip. Lieut. Conner took up passenger, after which he made two flights. Lieut. Porter, Staff-Sergt. Wilson, and Cpl. Ridd doing good flying. *B.2.*, the late Lieut. Cammell's Blériot, has come back after a few alterations, and having the body recovered again. Capt. Loraine will probably fly the machine.

The Plain (Bristol School).—Very little outdoor work possible in the morning; towards latter part of afternoon Mr. Pizey ascended with Lieut. Ercole on biplane No. 55, and on the same machine afterwards with Major Boyd Moss. Mr. Bettington was also taken for tuition flight. Lieut. Fielding was away with Mr. Lister as passenger. Lieut. Dawes then passed certificate tests, his observers being Capt. Loraine and Lieut. Fielding. Lieut. Pickles out for a fine solo, as also were Lieuts. Hartree and Dawes.

Waterloo (Liverpool).—Mr. Melly out on two-seater, first up alone and made series of figures of 8 in front of hangars, banking well at each turn. Then took up a pupil, Mr. Birch, and flying in direction of Freshfield passed over the "Mersey" hangars, Formby Golf Links, Hightown, and back over Little Crosby, a distance of about 18 miles. Altitude attained 1,000 ft. On return took up Mr. Reid and flew as far as Ince Woods across country, being on the wing about 9 mins., attaining 600 ft.

Thursday, May 30th.

Brooklands.—At Bristol School, Capt. Becke solo, doing three circles to left and one to the right. Mr. Hotchkiss then up with Mr. Wilmer for three circuits, then up again with Mr. Holyoake. Capt. Becke again two circuits. Mr. Hotchkiss again up with Mr. Wilmer, but a tappet rod broke on engine. Mr. Bettington out rolling on Anzani for 20 mins. Mr. Arthur practising landings on Anzani. In evening, Mr. Hotchkiss up solus, trying repaired machine.

At Avro School, Lieut. Parke, R.N., solo air-testing early, followed by Mr. "Darracq" and Mr. "Charlton." Both pupils again out in evening.

At Deperdussin School, in evening, Capt. Brooke-Popham out on racer, suffering a discontinuation, resulting in slight damage to wing tip and chassis.

At Spencer School, Mr. Spencer out afternoon and evening, solo and with pupil.

At Sopwith School, early, Messrs. Hedley, Herbert, Webb-Bowen and Powell all taking charge of school Farman from pilot's seat. Same pupils all out in evening. After school work, Mr. Raynham took Mr. Herbert to Golf Club House on Farman.

At Vickers School, Capt. Darbyshire making straight flights on No. 3, followed by Messrs. Knight and Hunter at midday.

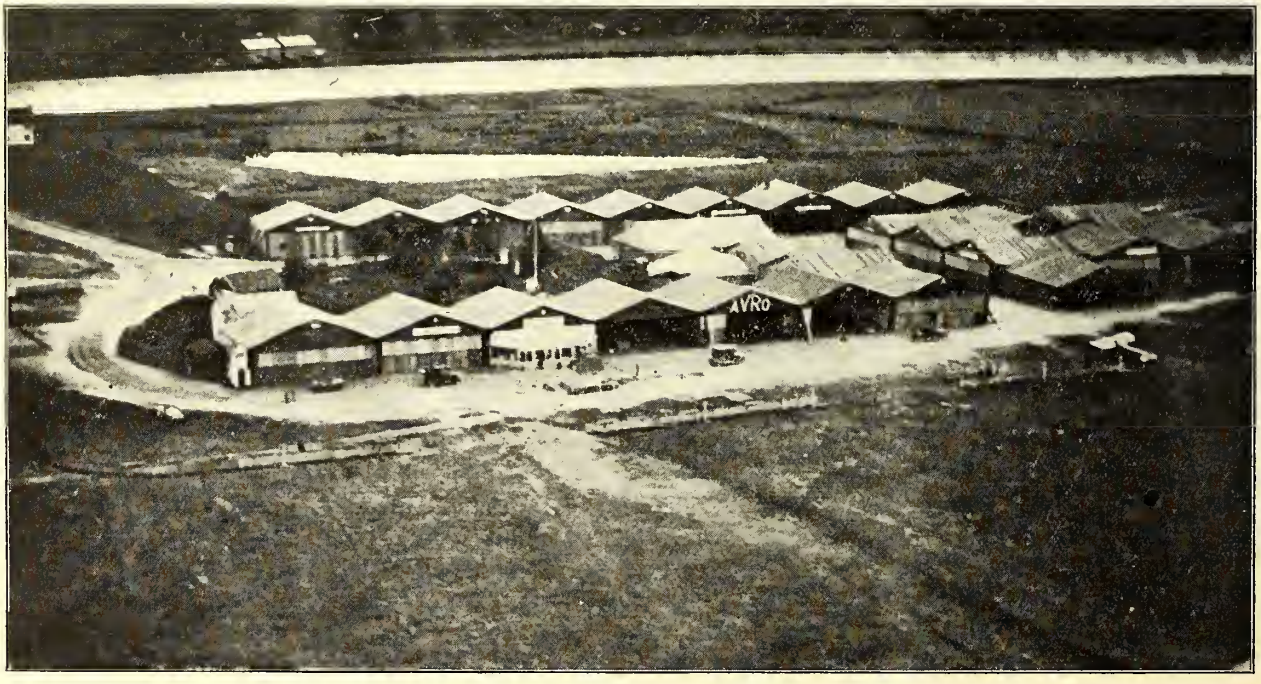
Chard.—Mr. Salmet arrived from Taunton on his Blériot, over abominably hilly country. There he visited the house of John Stringfellow, who, with Henson, built an engine-driven model monoplane in 1848. With typical French feeling, he dropped a rose wreath from his machine while flying over Stringfellow's house.

Eastchurch.—Lieut. Spencer Grey, R.N., and Mr. McClean made an early morning start for Margate, Lieut. Grey landing and Mr. McClean circling over the town and returning to Eastchurch. Lieut. Grey returned in the cool of the evening.

Hendon.—Mr. Hamel arrived from France on new Blériot single-seater, having left Hardelot at 1 p.m. In spite of fog in the Channel, he made a good course and landed at Eastchurch, where, after a short rest, he came on to Hendon, arriving just after 6 p.m., exactly an hour after leaving Eastchurch.

At Blériot School, M. Aubert at about 5 a.m. took out brevêt machine and doing circuits at about 100 ft., landing very neatly *en vol plané*. Messrs. Hall and Clappen meanwhile practising straights.

At W. H. Ewen School, M. Dubois was out on "Dep." doing circuits and figures of eight, and is now waiting a favour-



The main Block of Sheds at Brooklands, taken from the Flanders monoplane by Mr. Dukinfield-Jones.

able opportunity to go for brevêt. Miss Prentice, Messrs. Ware, Lawford, Apcar and Major Skipwith rolling and doing straights.

The Plain (Royal Flying Corps).—Lieut. Conner and Porter out on *F.8.* and *F.7.* Later Cpl. Ridd and Staff-Sergt. Wilson out doing solos, and Capt. Loraine on Deperdussin.

The Plain (Bristol School).—Nothing doing in the morning, Mr. Pizey giving tuition flights to Lieut. Wall and Mr. Lister in the evening, and then testing a new monoplane recently received from the Filton works. Mr. Bendall out with Mr. Lister and Lieut. Ercole. Some very good flights made by Colonel Smeaton, Major Boyd Moss, Lieuts. Fielding and Pickles, and Messrs Prendergast and Smith-Barry. Major Boyd Moss made first two solos, landing quite well. Mr. Prendergast was out for a flight, followed by Lieut. McArthur.

Friday, May 31st.

Brooklands.—At Bristol School, Mr. Hotchkiss out with Mr. Holyoake, then up with Capt. Becke, latter then two straights, two circuits and one figure 8. Mr. Arthur straights and one circuit on Anzani, but engine not pulling properly. Mr. Hotchkiss up solus, and then up with Mr. Holyoake. Mr. Bulkeley doing four straights. In evening, Mr. Hotchkiss out with Mr. Holyoake, then up with Lieut. Waldron for first flight. Mr. Arthur doing four straights on two-seater monoplane in good style. Mr. Hotchkiss up with Mr. Bulkeley, latter afterwards doing straights. Capt. Becke four circuits to left in quite choppy wind. Mr. Hotchkiss up with Lieut. Waldron, then up for short solo.

At Avro School, Lieut. Parke, R.N., out after lunch, solo, followed by Mr. "Darracq," making straights. Mr. "Charlton" then took over, but almost immediately discontinued. Severe landing broke nearly all chassis bracing wires, and on attempting to turn one side of chassis folded up. Very little broken, but machine distinctly untidy.

At Vickers School, Capt. Darbyshire and Messrs. Knight and Hunter out on No. 3 making straights, morning and evening.

At Sopwith School, early, Messrs. Hedley, Powell, Webb-Bowen and Herbert making circuits from pilot's seat [Accompanied by the machine and Mr. Raynham.—Ed.], Mr. Herbert being afterwards taken to Golf Club for breakfast. Afternoon, Messrs. Powell and Herbert again out with Mr. Raynham, and in evening Messrs. Wadden, Herbert, Webb-Bowen and Hedley out, latter flying solo.

Eastchurch.—Lieut. Spencer Grey, R.N., on 70-h.p. tractor. Lieuts. Hewlett and Malone, R.N., made flights to Margate, returning in evening. Mr. McClean also testing 70-h.p. hydro-biplane at Harty Ferry.

Freshfield.—Immediately after thunderstorm, Messrs. Fenwick and Swaby took Mersey monoplane out, and although calm near ground, above 300 ft. there was strong and extremely gusty wind, which tossed machine about like a cork. They flew to Ainsdale, returning past Freshfield, finally circling over Altcar Rifle Range. As wind seemed to be getting worse and general gloom made seeing very difficult, machine was brought in. Machine recently fitted with "Melly" release gear, found to work splendidly. Every machine should use such useful (and at times absolutely necessary) little fitting. Mr. Higginbotham also out for short time on biplane, finding the wind very tricky, but flying very steadily.

Hendon.—Air calm, but "rocky"; remous everywhere. At Grahame-White School, in morning, Messrs. Morris and Roupell flying circuits, Messrs. Wynne and Rathborne straights, after which Mr. Lewis Turner brought out the Howard Wright to test its engine. In evening, Messrs. Scully, Wynne, Rathborne, and Manton doing straights with instructor, and Messrs. Manton, Morris, Roupell, and Kershaw circuits; this on Farman. Madame La Baronne Schenck doing straights with Mr. Turner, and Lieut. James doing straights and circuits on Howard Wright.

At W. H. Ewen School, Mr. Warren flew Blériot very well and Messrs. Gist, Ware, Lawford, James Brothers and Miss Prentice put in useful rolling practice.

The Plain (Royal Flying Corps).—Capt. Loraine out on Deperdussin, doing excellent flying. Lieuts. Conner and Porter on *F.8.* and *F.7.*, also doing well. Cpl. Ridd out, and up to 500 ft. Capt. Loraine out again in evening, taking up a passenger. On this trip passenger was observing an infantry regiment. Next trip also with passenger, and did not return to sheds for over half an hour. His height was about 2,000 ft. Lieut. Conner took the Deperdussin out and did splendid flight.

The Plain (Bristol School).—Mr. Pizey testing another new monoplane, Mr. Bendall giving tuition to Mr. Lister and Lieut. Ercole. Lieut. Fielding also up with Mr. Lister. Lieut. Ercole good flight on one of the monoplanes. Mr. Bettington also out on similar machine, flying round Fargo and Stonehenge. Major Boyd Moss good solo, and Mr. Prendergast up at about 700 ft., landing with fine *vol plané*. Major Boyd Moss was up practising right-hand turns. Lieut. Pickles made his best flight up to now, reaching close on 1,000 ft. and finishing with *vol plané*. Major Boyd Moss up practising right and left-hand turns. Mr. Bettington had unpleasant experience. He set out for a solo on one of the monoplanes, and was quickly lost to view. School motor car made several journeys to find him, but of no avail, and Lieut. Fielding and Mr. Smith-Barry made flights in all directions in order to locate him. Motor car again started out with strong field glasses, and discovered Mr. Bettington near South Down Camp, having been in the air longer than he at first intended and exhausted his petrol supply. Mr. Pizey flew the machine back to the sheds. Mr. Smith-Barry gave tuition in landing to Mr. Lister and Lieut. Ercole. In evening Mr. Pizey two flights to Lieut. Gallaher, who is making favourable progress. Mr. Bendall out with two passengers. Good solos by Mr. Prendergast, Lieut. McArthur, Major Boyd Moss with figures of eight. Lieut. Pickles pretty flight at about 700 ft., finishing with *vol plané*. Lieut. Ercole and Messrs. Lister and Rawson Shaw first trips. Mr. Smith-Barry out with Lieut. Ercole, Lieut. Fielding with Mr. Lister.

Saturday, June 1st.

Brooklands.—At Bristol School, thick fog early. Mr. Hotchkiss out with Mr. Holyoake for two circuits. Then Capt. Becke four straights. Wind too choppy for pupils' circuits. Mr. Arthur then doing straights on two-seater monoplane.

Mr. Gordon Bell landing the Bristol military monoplane in a high wind at Brooklands on Sunday last.

On landing he bounced and had to pick machine up and go out over Byfleet to get back to make another landing. He managed this splendidly and landed very well after. Afterwards he made left- and right-hand turns. Mr. Hotchkiss two solus, trying machine. In evening, Mr. Hotchkiss for solo, but wind and rain stopped flying.

At Deperdussin School, early, Lieut. Gill out for 20 mins. on racer, followed by Capt. Dawes making straights.

At Sopwith School, Mr. Raynham out early with Messrs. Herbert and Webb-Bowen. Mr. Hedley making straights, solus. Mr. Herbert again transported to Golf Club for breakfast. School machine average 3½ hours per day for the week.

At Vickers School, early, Capt. Darbyshire on No. 3, straights. Evening, Capts. Beattie and Knight on No. 3.

At Spencer School, Mr. Spencer out in afternoon circuits solus, then with pupil for landing practice.

Mr. Kemp out early on Mr. Ducrocq's Farman, intending to go to Hendon. Finding thick mist Londonwards, returned via Chertsey and Addlestone.

Freshfield.—Mr. Higginbotham was out in evening, flying very well in spite of puffy east wind. Mr. King brought out his Farman, but experienced hard luck. Just as engine was opening out a dog suddenly made a dash at propeller, which was smashed, and considerable damage done to the machine. Such portions of the dog as were left were buried.

Hendon.—In morning, Mr. Morris made some excellent circuits on Farman, after which school suspended while Mr. Manton and Lieut. James got their brevets, both in excellent style. The latter, it may be mentioned, was ready for his brevet after only four days' tuition, but his first attempt on it was spoiled by the failure of his engine. In evening, no school work owing to meeting.

The Plain (Royal Flying Corps).—Capt. Loraine took Deperdussin out, but owing to fog, was unable to go far. In evening Lieuts. Conner and Porter out on *F.8.* and *F.7.* Also Cpl. Ridd and Staff-Sergt. Wilson.

The Plain (Bristol School).—Very foggy, but Mr. Bendall two tuition trips to Mr. Featherstone, and Mr. Smith-Barry up twice with Lieut. Ercole. Major Boyd Moss flying well in spite of fog. Lieut. McArthur three good flights.

Exeter.—Mr. Salmet arrived after fine flight, in heavy rain.

Sunday, June 2nd.

Brooklands.—Wind and rain in morning. In afternoon, Mr. Bell flying capitally on Bristol military monoplane. Mr. Hotchkiss short flights on Bristol biplane, and Mr. Raynham several very uncomfortable circuits on Sopwith school Farman.

Hendon.—Calm weather in morning, which Grahame-White School devoted to less advanced pupils. Messrs. Rathborne and Carr and Capt. Salmond doing straights with Mr. Noel, while Mr. Lewis Turner took charge of Madame La Baronne Schenck on Howard Wright.

Whit-Sunday with the Royal Flying Corps.

Staff-Sergt. Wilson and 2nd Corporal Ridd were both doing some very good solos in the morning, but owing to a fog coming flying had to be stopped. Later Lieut. Conner went out on *F.8.* and had a fly round, after which he went to look for Capt. Loraine, who was flying here from Buckingham. Owing to the fog, Capt. Loraine had to come down near Siddeley Hill until it cleared away, after which he reached the sheds at a good height, descending in a spiral at 8.45. Lieut. Conner and Staff-Sergt. Wilson were out on *F.8.* and Cpl. Ridd out on *F.7.* in the evening. Capt. Allen was out early Sunday morning, flying the Bristol monoplane for 30 mins.

Whitsun at Filey.

On Whit-Sunday at Filey, Mr. Brereton was out giving exhibition flights. He put in some very fine flights during the latter part of the afternoon and did some excellent *vols planés* with the engine shut off. He then made several trips with passengers, a sport which is now becoming quite popular amongst the visitors in Filey. All the flights were made with the Isaacson-engine machine, which is running remarkably well; moreover, it climbs with passengers much better than that with the Gnôme, owing to the extra power the Isaacson gives, although it also is only rated 50 h.p.

Exhibition and passenger flights were given on the Monday and Tuesday, during which time the pupils were not practising owing to the danger caused by the large crowds.

Whitsun Flying at Freshfield.

During the Whitsun week-end there was a good deal of flying at Freshfield. On Saturday, having several visitors from London and Hull, Mr. Fenwick took them up as passengers in the "Mersey" monoplane. Three or four of the ladies, after seeing the machine in flight, showed their confidence in it by taking flights of several miles, and more than one remarked that to their surprise it was as comfortable as, if not more so than, railway travelling. The machine is certainly remarkably steady even in comparatively high winds, and the facility with which it is manœuvred on the beach is remarkable. Finally, Messrs. Fenwick and Swaby flew over Southport Pier, returning and circling the Altcar Rifle Range. The inhabitants of this district have now no doubt as to the identity of the machine, as the name is brilliantly painted on both wings.

On Whit-Sunday, in the afternoon, Captain Dick (of the Permanent Staff of the Territorials) and a brother officer visited the hangars, and had the features of the aeroplane explained to them. Captain Dick, as passenger with Mr. Fenwick, had a 16-mile cross-country flight, returning to the starting point with a beautiful *vol plané*. Captain Dick was enthusiastic as to the military possibilities of the Mersey type.

Mr. Moorhouse's Tour.

Although he has never had the honour of being boomed as a "birdman" by any of our big daily papers, there is no more capable cross-country flier in this or any other country than Mr. W. B. R. Moorhouse, who has done an astonishing amount of work lately on his Radley and Moorhouse monoplane. Last week, for example, he made a little tour which deserves considerably more notice than it got. On Wednesday he flew from Brooklands to Northampton, and though his engine started missing badly ten miles or so from home, he went on to his family's place at Spratton.

On the Thursday morning he flew to Kettering, where he had arranged to do some exhibition flying at the local Show. The machine was on view during the day, and in the evening he gave a series of very interesting flights, after which he flew over to Huntingdon for the night. Next day the machine was laid by while Mr. Moorhouse attended to some business of the firm of Radley, Moorhouse and Morison, Ltd., in which he is interested, and on Saturday he flew to Hendon, covering the 60 miles in 46 minutes. There he competed in the cross-country race, was second in the final of the speed handicap after winning his heat, and was second in the altitude competition. Not a bad bit of work for the latter part of a week.

The Flanders-Page Alliance.

The Flanders monoplane is too well known in aviation circles to require a detailed description. Its numerous flights at Brooklands have elicited many tributes to its excellence of design and construction. In 1911, in the British Michelin duration competition, it flew for 1½ hours with 42 gallons of petrol and 10 gallons of lubricating oil, this being the heaviest load ever carried by a monoplane in this country, but, unfortunately, had to descend owing to the oil gauge breaking.

The demand for this type of machine has increased so that L. Howard-Flanders, Ltd., have decided that they must devote the whole of their attention to further improving and perfecting the type of machine which they now make, and to designing newer types, so that they may keep in the forefront of the rapid present-day march of aeronautical progress. To enable them to do this they have turned over the whole of their selling organisation to Messrs. Handley Page, Ltd., who will in future act as the sole selling agents for all their products and to whom all inquiries should now be addressed.

L. Howard-Flanders, Ltd., are already making four machines for the British War Office, and are tendering for the construction of others to several foreign Governments. Their new works at Richmond are equipped with the latest machinery for dealing with aeroplane work, and a further extension will take place in the school under their control at Brooklands. One wishes the new alliance every success.

The Scottish Aeronautical Society.

The meeting of the Council was held on Friday, 24th ult., when Mr. James C. Weir was co-opted as a member. The following Sub-Committees were appointed:—Finance: Convener—A. J. Law; Members—Professor A. Barr, R. R. Speirs, J. A. Sillars, Robert Guy. Competitions, Sports, Exhibitions, etc.: Convener—J. A. Sillars; Members—D. G. Anderson, P. L. O. Guy, J. R. K. Law, William Macnab, R. J. Smith, Hugh Reid, Jas. G. Weir, R. R. Speirs, T. Logan. Technical: Convener—Professor A. Barr; Members—C. J. Waldie, D. G. Anderson, R. W. Hogarth, J. R. K. Law, J. Clinkskill, Jas. G. Weir. Ground, Buildings, Workshops, etc.: Convener—R. R. Speirs; Members—J. R. K. Law, P. L. O. Guy, R. J. Smith, John MacGill, Hugh Reid, T. Logan, J. A. Sillars, C. J. Waldie, J. R. Renwick. Lectures and Papers: Convener—Robert Guy; Member—J. A. Sillars. S.A.S. Model Club: Convener—J. A. Sillars; Members—T. Logan, J. Allison, junr.

MISCELLANEOUS ADVERTISEMENTS

All Advertisements for this column should arrive at this office by 6 p.m. MONDAY, to ensure insertion.

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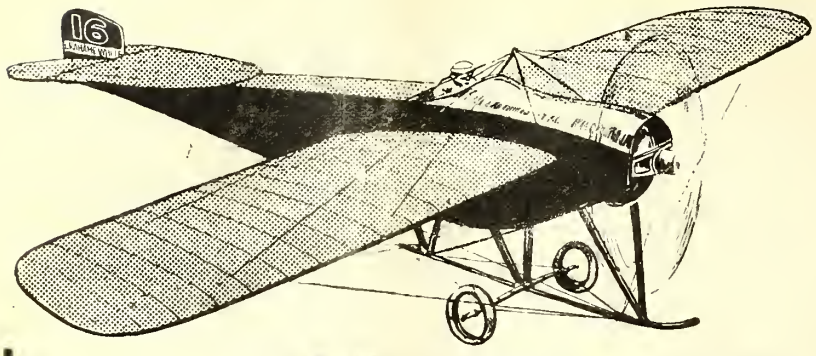

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(WEATHER PERMITTING)

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THE AEROPLANE

1d WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

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AT THE POST.

THE START FOR THE AERIAL DERBY:—Mr. Sippe, on the Hanriot, has just started. Mr. Sopwith, on his 70-h.p. Blériot, the first home, is in the foreground. Beyond him are Mr. Hamel and Miss Davies, on their 70-h.p. Blériot; then M. Verrier and Mr. Castles, on the Maurice Farman; and just beyond the pylon Mr. Moorhouse on the R. and M. On the extreme left Mr. Valentine, on the Bristol, is being wheeled into line; and facing him is M. Guillaux on the Caudron. The other machines on the ground are Mr. Sabelli's little Deperdussin, Mr. Cody's biplane, two Grahame-White biplanes, and Mr. Raynham's Burgess-Wright with the A.B.C. engine.

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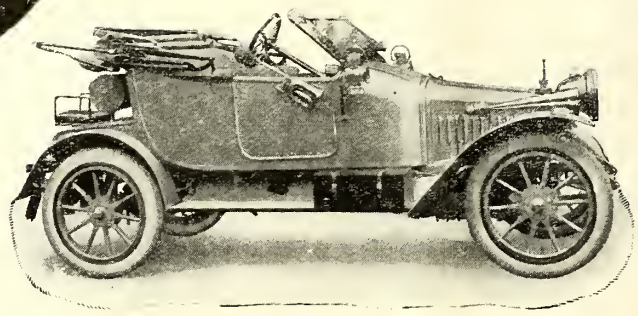

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Editorial and Advertising Office—166, Piccadilly. Telephone—5407 Mayfair. Telegrams—Ailfron, London.

MATTERS OF MOMENT.

THE POSTPONEMENT OF THE TRIALS.

It was suggested in these columns a fortnight ago that the officials responsible for the War Office aeroplane competition would show their goodwill towards British aeroplane constructors by receiving in a most friendly way any request that the commencement of trials should be postponed owing to the difficulty of getting machines ready for delivery at Lark Hill by July 15th. One now learns that such a request has been formally put, and though at the moment of writing no official announcement has been made, it is quite likely that the date of delivery may be postponed for a fortnight or so, and that machines may be accepted up to August 1st, or thereabouts; in fact, the postponement may be officially declared by the time these notes appear.

Of course, a delay of a fortnight is not much, but quite a good deal of testing and tuning may be done in the time, if work is pushed forward between now and the middle of July. A month would have been better, but one must remember that there are others to be considered besides the constructors, namely, the officers who will be concerned in judging the machines and in generally conducting the trials. The Autumn Manœuvres commence at the beginning of September, and all these officers have their duties already mapped out on manœuvres, so they must be clear of the aeroplane trials before they are wanted for the bigger work.

It has been suggested that the date of delivery of trial machines might be left open, and that any manufacturer might be free to send in his machines whenever he liked, trusting to the ability of the machines and pilots to get through the tests in a few days before the definite close of the competition. This certainly might please one or two constructors, but, knowing the habits of manufacturers all the world over, it is obvious that such a concession would merely mean that a few machines rushed through at the last moment would be sent in for the very strenuous tests, probably with fatal results. We saw much the same kind of thing happen in the French trials last autumn, and a repetition must be avoided in this country at all costs.

Even as it is, the rules merely state that the machines must be delivered complete in a case at Lark Hill. There is no proviso that they must have flown before being delivered, so there is nothing to prevent a constructor from simply getting all the parts through, putting them into a box, sending them to Lark Hill, and thereafter setting to work to erect the machine for the first time, doing all the tuning up and minor alterations on Salisbury Plain.

If the authorities had wished to be really severe in the test, they might well have stipulated that the machines were to be delivered by air to Salisbury Plain from any point not less than 50 miles away, just to show that they were real flying machines before they arrived, and were not, like some of the French trial machines, mere experiments which wasted official time and money.

As it is, everything has been done to meet the manufacturers, with the exception of the unexplained delay in issuing the final rules and regulations—a delay which, as the writer said recently, must not be blamed on the officials, who have done their best, but, in all probability, on a politician who was so busy playing at being a statesman that he forgot the needs of his department.

Let us hope that the constructors in their turn will do everything in their power to help the officials in charge of the trials, by delivering their machines as quickly as possible, and by giving as little trouble as may be when the machines are on the spot. One gathers that everything possible is to be done for the comfort and convenience of competitors. A big camp, as well equipped as one can reasonably expect, is to be laid out at Lark Hill, where assistants and mechanics will be housed under canvas, and everyone will be made as much at home as circumstances will permit, and one must admit that those of us who have to spend our August days in stuffy town offices will envy considerably our lucky friends camped on the top of Salisbury Plain. Probably the hardest worked men there will be the Judging Committee and the officers in charge of the trials, who will have to be up early and late for the convenience of any and every competitor who wants to go for his tests, in spite of the fact that they have got the hardships of manœuvres in front of them, while the competitors in the trials can go and have a holiday.

Few people realise the amount of hard work the British officer does for his paltry stipend, but some of those who go to the Plain for the trials will find out, and it is to be hoped that they, especially the crack pilots who are to fly the machines, will do their best to help the officers controlling the trials by behaving as much like gentlemen and as little like operatic stars as possible.

There are some officer-aviators in the Service already who could fly the wings off our best civilian pilots if they were allowed to perform in public, and it might not be a bad idea to let a few of them do some flying while the trials are in progress, just to show the competition pilots that they are not the only birds in the air. Some of us who have had to do with aerodrome competitions have had quite enough of the type of aviator who

"doesn't know yet" whether he will fly in a given competition or not, and only makes up his mind at the last moment when the other competitors are on the line, so upsetting everyone's arrangements to please himself. These gentry will need to be gently but firmly put in their place in the military trials, by having it impressed upon them that they are paid drivers of the constructors, and of precisely as much importance as a chauffeur, otherwise they will start giving themselves airs, and become a nuisance to their employers and the officials. There is no need to indicate any particular individual, and, needless to say, these remarks do not apply to many of our crack fliers, either among those with newspaper reputations or those whose real abilities are only known to the intimates of aviation; but men of the type exist, and to such one need only recommend them to order themselves lowly and reverently to all their betters and to those set in authority over them. So the trials may be made both useful and enjoyable.

British Pilots in France.

There will be two British competitors in the "Circuit d'Anjou" which takes place on the 16th inst. Mr. Hamel is to fly a Blériot monoplane, and Mr. H. J. D. Astley is to fly a R.E.P. It is a pity that some of our other crack pilots cannot go over, as we should now be able to put up a show against the best France can provide.

Mr. Kemp's Move.

His many friends connected with aviation will be interested to learn that Mr. Ronald Kemp has now joined the staff of the Bristol Company as pilot. Mr. Kemp, like so many other excellent pilots, learned to fly on the Avro biplane at Brooklands, and also did a considerable amount of flying there on the Vickers monoplane and the Flanders monoplane. More recently he distinguished himself by doing excellent flights over Windermere on Mr. Gnosspelius' hydro-monoplane. He is certain to prove an acquisition to the Bristol School, for though he is one of the quietest and most unassuming of pilots, he is certainly one of the soundest fliers in the country, and is eminently what one would call a safe flier, though by no means lacking in dash and address when really clever flying is any advantage.

Mr. Weir of Glasgow Again Flying.

On Sunday, June 2nd, Mr. Weir came to the London Aerodrome to take delivery of his new 50-h.p. Blériot, and Mr. Hamel, who was also on the ground for the purpose of taking up the 70-h.p. tandem two-seater, put Mr. Weir's machine through its aerial paces, after which Mr. Weir took his machine over and did some flights and expressed himself very pleased with his new mount, showing, meanwhile, that he had lost none of his accustomed skill in handling the machine.

To Prevent Misapprehension.

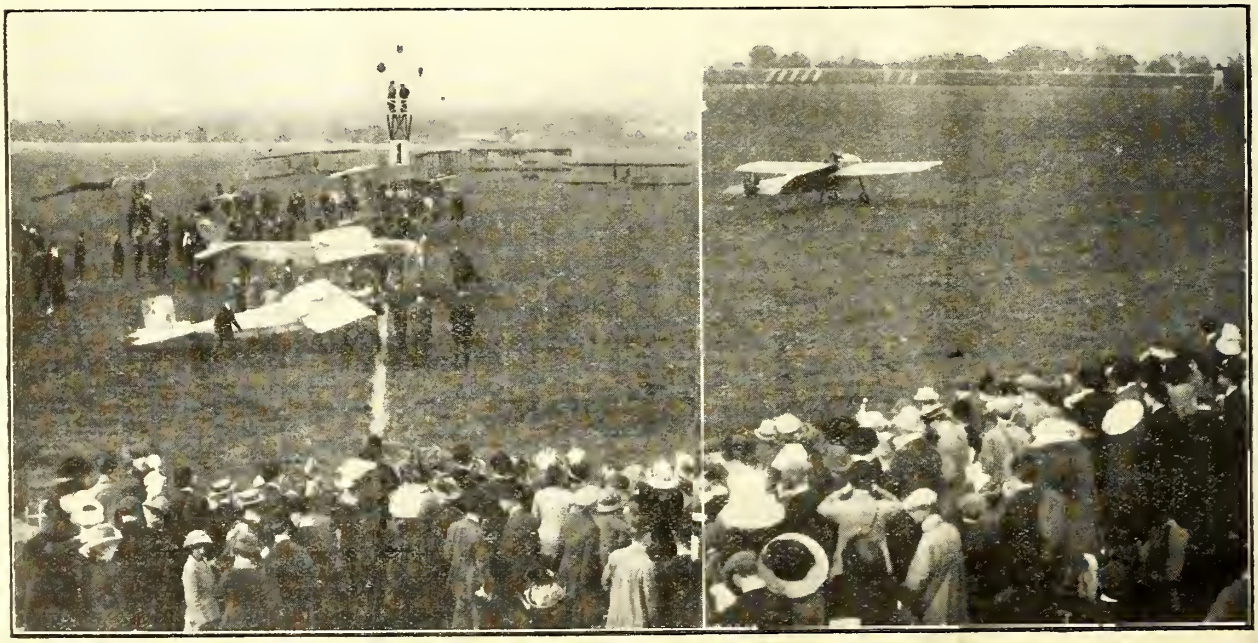
The All British (Engine) Co., Ltd., of Brooklands, write: "We venture to draw your attention to the wording of the first paragraph under Thursday, May 23rd, in the "Week's Work" appearing in a recent issue of your paper. It has occurred to us that anyone reading the paragraph casually may get the impression that a cylinder was blown off the A.B.C. engine, as this paragraph mentions two Wright machines and only this engine. The cylinder was blown off another make of engine in the Howard Wright machine. As any such mistake would be prejudicial to us, we should be glad if you will make this clear in your next issue."

It is a pleasure to publish this note, for the little A.B.C. on the Burgess-Wright has done a colossal amount of work and has won a number of competitions, without giving any trouble beyond chewing up chains which stood up to the work of an American engine and a Gnôme, which merely shows its excess of power.

Belgian Hydro-Aeroplane Meeting.

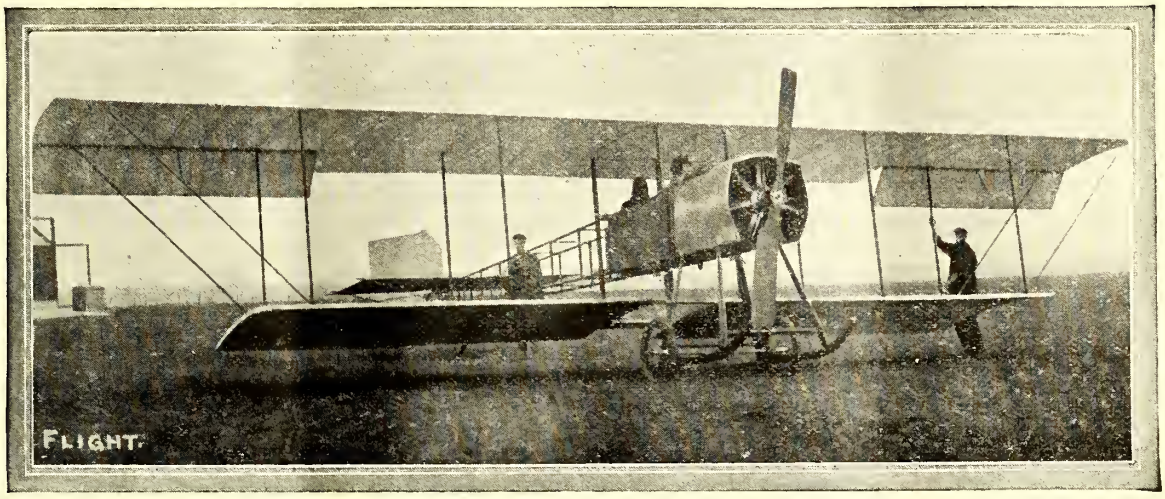
An International Hydro-Aeroplane Meeting will take place at Tamise, on the Escaut, Belgium, from September 1st to 9th next. The meeting is being arranged by the Aero Club of Belgium, and will be held under the patronage of H.M. the King of the Belgians and under the auspices of the Belgian Colonial Office. The purpose of the competition is to test the capabilities of hydro-aeroplanes, with a view to their utilisation in the Belgian Congo. The prize fund now amounts to 30,000 francs, and the meeting will comprise the following competitions:—(1) Total aggregate duration; (2) Quickest get-off with the stream; (3) Quickest get-off against the stream; (4) Longest distance without alighting; (5) Ease in steering. Each machine must carry one passenger in addition to the pilot, and extra points will be awarded for additional passengers. Points will also be allowed for certain mechanical details.

Entries should be sent in to the Aero Club of Belgium, 6, Avenue Marnix, Brussels.



The Start of the Aerial Derby.—On the left, the second instalment of starters, after the departure of Messrs. Sippe, Sopwith, and Hamel. On the right, Mr. Sippe, on the Hanriot, is just getting away.

CONTRACTORS TO THE ADMIRALTY.



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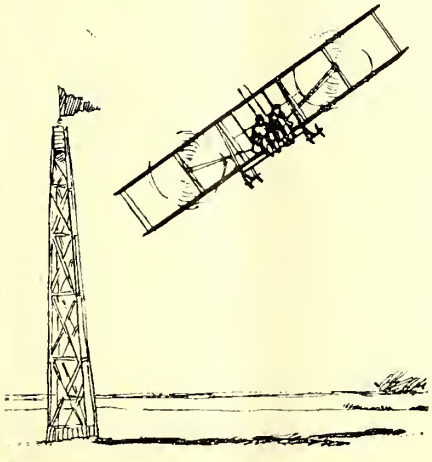

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Fighting in the Air.

BY W. E. de B. WHITTAKER.

There is published by the General Staff a small book entitled the "Field Service Pocket Book," containing innumerable notes, plans, and figures relating to matters of general interest in the Army. From time to time new editions are issued—there is a large demand—and the entire work is periodically subjected to revision as the science of war advances. It is prefaced by a warning note that "It should not be quoted as an authority in official correspondence, nor should it be utilised as a text-book for the study of military subjects." Therefore, one must be wary when one quotes this authority, which is only authority so long as its use brings success to our budding Chausewitz. When disaster follows a too close adherence to its precepts, then does the official mind quote with due gravity and emphasis the absolving prefatory note.

But withal the contents of this book are some index to the mental attitude of officialdom. One can therefore read lessons from its lines with all due reservations. The latest edition made its appearance this month. The firm adherence of our authorities to the golden rule enshrined in the words "*Festina lente*" has not faltered, and it is therefore not surprising to find one single reference to aircraft in the pages of this compendium of useful knowledge in the arts relating to the destruction of man by his unkind brother. Under the heading: "IX.—Reconnaissance of a position. In the attack," Par. 2, one reads: "In the future airships and aeroplanes may facilitate these reconnaissances; but it must not be forgotten that the enemy himself possesses aircraft which must first be defeated, and that aerial observers are likely to make mistakes, or to be misled by the enemy." So it seems that even the innocent exhibition flyer employed by our War Office to dazzle an admiring enemy with deeds of aerial daring is liable to be misled like a child by the designing soldiery of a malevolent country. But so it is in life, the shining robe of innocency is no protection against the wiles of the wicked. But it is something to discover that in the official view aerial scouts will engage as a preliminary to prolonged reconnaissance. One would have thought that in the present state of imperfection combat would be avoided as far as possible.

The only positive method of fighting between aeroplanes at the moment is by means of collisions, which would, of course, destroy both machines. Heroism is a curious virtue. Men of great courage will readily die for others and for their country so long as there appears to be the slightest hope of escape. That is, men will lead forlorn hopes, remain behind on sinking ships, and attempt to rescue the drowning. In all cases there is a chance of life, however remote. But there are very few indeed who would willingly go to certain death even in the sacred cause of their country, and those few are not invariably aviators. I believe the British race can show as bright a record of bravery as any nation the world has seen, but there is a limit to endurance, there are bounds to self-abnegation. And though politicians, for their own purposes, may speak with magniloquence of the dauntless daring of those who form, or are to form, our aerial force, the military aviator is animated by no greater spirit of bravery than is the average soldier in his Majesty's Service. To suppose so would be an insult to the memory of the thousands of gallant men who have died for this country in the past. The memory of past deeds is the inspiration of our future bravery.

It is too much to expect the mutual destruction theory to be carried out in any but isolated cases. Besides the loss of an aeroplane and pilot to the enemy by this method is balanced by a similar loss to us. The gain is not obvious. The "washing" down of aeroplanes will be of similarly rare occurrence. It implies in most cases that the successful machines will be much swifter than that which is washed down. There will be but few machines in armies of the future capable only of such speed as will make them dangerously unstable when caught by the propeller draught of another aeroplane. Again, such combats will take place at a height of about two thousand feet (presumably if an aeroplane is attacked when low down it will land at once), which leaves ample space for recovery of stability before reaching the ground. It also pre-ordains piloting of great skill on the one part and stupidity on the other. The control of aeroplanes will reach in a year or two a level of equality unthought of to-day, when the variation in the ability of pilots is so great.

Bomb-dropping at Large.

Bomb-dropping will probably be used against dirigibles subject to many limitations. The proverbial "Man in the Street" has the most casual ideas as to the utility of dropping high explosives from aloft. It seems "so simple." One has merely to drop the deadly object and destruction—of something or other—follows. Combats between aircraft are not necessarily confined to any section of the sky; there are no ring fences in the air, and one of our aeroplanes may be attacking a dirigible while flying over our own forces. The miscellaneous dropping of bombs under these circumstances would probably cause considerable annoyance to the G.O.C. our own Army. The premature deflation by means of violence of an opposition dirigible over a battalion of infantry would be unpopular, and undesirable if the aeroplane pilot desired to retain the respect of his seniors. Other means must be employed. One cannot take a hostile dirigible in tow. It must be enticed away, or. in the first case, never allowed to reach an important point. But if it is operating over the army to which it is attached any possible means of destruction may be employed. The quality of mercy might be strained ruthlessly.

Those who write learned treatises on warfare in the air, with that entire lack of knowledge so completely shared by myself, speak of aeroplanes flying above dirigibles and dropping means of dissolution on their tightly stretched skins, as if it were the simplest thing on earth. It may be, but one would imagine the emergency climbing rate of a dirigible to be considerably higher than that of an aeroplane, particularly if that the latter had been designed purely for speed. The manœuvring of an aeroplane is, of course, much quicker than that of a lighter-than-air machine. In an aerial combat the aeroplane would probably find it easier to attack the dirigible with rifle fire. Of the amount of damage possible by this means I have no knowledge. Similarly, in a combat of aeroplane against aeroplane the rifle is the weapon most likely to be used at present. The machine-gun affixed to a Voisin biplane displayed at the 1910 Paris Aero Show would probably be disastrous to the aeroplane using it. Aeroplanes must be greatly improved and machine-guns reduced in weight and size before any useful combination of the two is devised. That is a question for the future.

Rifle Fire.

The modern rifle employed in European armies of the present day is, to take the average, sighted up to about 2,200 yards. The range at which it is possible for the average marksman to hit anything smaller than a haystack is certainly less than 800 yards. Complicate this by moving both the rifleman and target in opposite directions at speeds in excess of sixty miles an hour and it will be seen that rifle firing in aerial warfare does not resemble Bisley. The excitement consequent on flying which is never entirely absent even to those whose aviation experience is long and varied, and the disturbance caused by unexpected movements due to gusts and *remous* both have an evil influence on accuracy of aim. Experience will, of course, qualify this view, but these

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are the difficulties seen at present. Aerial combats will afford an exciting interlude to the battle of the future. At present I am of the opinion that aerial scouts will endeavour as far as possible to avoid coming into contact. Circumstances will occasionally force an engagement, but there will be no rule on the point.

Artillery Fire.

The destruction of aircraft will, it seems to me, be undertaken by artillery in the ordinary way. The range of Krupp's aerial gun is well over 4,000 yards. Presumably shrapnel would be employed. Shrapnel bursting 200 yards short of the target would affect an area of not less than 45 yards at the target itself. It will be seen from this that the artillery hold a strong position. The aerial disturbance set up by shrapnel will obviously extend over a large area—how large I cannot say—but enough to disarrange the normal flight of even the fastest aeroplane though no actual hit is made. There are many other means by which artillery can make life a thing of no joy to the scouting aeroplane. Gun practice of this sort will no doubt have high interest to the scientific artilleryman. To him at least the aeroplane brings new and absorbing problems. The destruction of human life has, since a period shortly after Adam made his fatal but charming mistake, been the most enthralling of pursuits. The discovery of new methods of disseminating sanguinary death is welcomed by millions beyond the confines of China or Whitechapel.

As I write there appears in the public prints a brief account of a new machine-gun devised by the ingenious and imaginative inhabitants of the United States of America for use on aeroplanes. Its calibre is that of the Springfield rifle (standard pattern, U.S.A. Army, calibre .3), and it is supposed to be capable of firing 500 rounds a minute. Tests have been made at Augusta, Georgia, with this gun from a military Wright biplane while flying at a height of 300 feet. So far it has only succeeded in firing a round a second, owing, it is said, to the extreme caution of the operator. The report concludes with the naïve statement that "firing from an aeroplane is itself a novelty."

The aerial conflicts imagined by the late Poet Laureate will hardly materialise in our day, and the dreams of H. G. Wells have too much of the bloodthirsty romance inseparable from glorified journalism. War in the air, like war on land, is tragically scientific in reality. The glamour dies as the rattle of the drums fades away and death takes control.

German Military Aviation.

Elusive rumour suggests that the public subscription for the purchase of aeroplanes for the Army has now reached a total of over 3,000,000 marks. An exaggerated secrecy is an inviolable principle in Germany.

At the present moment there is at Döberitz an aviation corps composed as follows—a staff officer, three captains, 11 lieutenants, 29 N.C.O.'s and 183 rank and file. Sections of this corps will shortly be transferred to Darmstadt, Strasburg, and Metz.

Each person owning an aeroplane who is willing that in time of war his machine should be used by the military authorities is to receive a retaining fee from the Government. All civil aviators are to do one year's military service.

Attempts have been made by the Government to purchase the German patent rights of certain successful French motors. An English monoplane has been acquired and is stationed at Döberitz.—W. E. de B. W.

French Military Aviation.

The newspapers of both France and England announced some ten days ago that Lieuts.-Aviator Nicaud and Ménard had been arrested in the vicinity of Mars-la-Tour on a charge of espionage. It seems that the mistake arouse from the misreading of a telegram. Their automobile broke down near the above-mentioned place ,and their chauffeur sent a wire to Verdun saying that they were "*arrêtés.*" Consequent consternation amongst the soldiers of France! The two mislaid aviators returned safely to Verdun in the early hours of the next morning. French officers should not make tours of the battlefields of 1870, especially when these scenes of one-time bloodshed lie within the boundaries of an inhospitable country. Surely the warnings of treachery received by England last year are sufficient demonstration for the world to learn.—W. E. de B. W.

French Naval Aviation.

M. Colliex has been engaged during the last few days in making trials with the Voisin biplane hydro-aeroplane (*type Canard*) recently supplied to the French Navy. It is stationed on board the aviation mother ship, *La Foudre* at St. Raphael. Several flights were made from the surface of the water, some without a passenger and some with Lieut. de Vaisseau Cayla on board. Complete success attended the experiments.—W. E. de B. W.

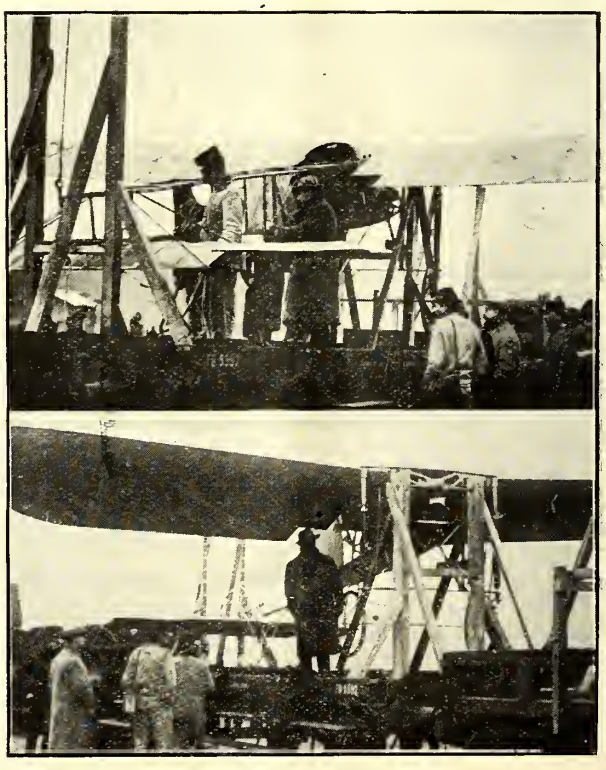
A New Blériot Test.

A fortnight ago an elaborate and interesting series of experiments were made to test the strength of a Blériot monoplane under flying conditions but without the slightest risk to the pilot. Colonel Estienne, commanding Technical Headquarters of Military Aviation at Vincennes, was in charge of operations.

The monoplane was mounted on a special railway truck on the *Chemin de Fer du Nord* in the manner clearly shown in the accompanying photograph. The machine could take all the positions assumed by an aeroplane in flight while the train was in motion. Captain-Aviator Charet took the pilot's seat, and Lieutenant-Aviator Maillot accompanied him as a reserve. The train then proceeded at a rate of about 72 miles an hour, that is, twelve miles an hour in excess of the average speed of the monoplane under test. The pilot made the machine take the diving or rising position with a jerk. He warped heavily—in fact, did everything to strain the aeroplane to the utmost.

At the conclusion of the test the Blériot was examined but without finding the least trace of weakness, though the tests imposed represented almost double the strains possible in ordinary flying.

There were present at these tests Colonel Hirschauer, Inspector-General of Aeronautics, Colonel Bouttieaux, commanding at Chalais Meudon, Commandants Lucas-Gerardville and Railand, Captains-Aviator Duperon, Couade, Dorand, and Lenoir, and a great number of junior aviator officers.—W. E. de B. W.



The Blériot testing apparatus on a railway truck. The system by which the machine is arranged to have a universal joint on the nose of the Gnôme engine is clearly shown, as is the method of guiding the tail.

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The Aerial Derby.

An Uncertain Result—Mr. Hamel and Miss Davies the Probable Winners—Mr. Sopwith's Possible Hard Luck—The Wonderful Performance of the Little Caudron—Mr. Moorhouse and Mr. Valentine on British Machines put up a Fine Race—Setting the Seal on Hendon's Popularity—A Preliminary Success for a British Engine—A Dangerous Course, Dangerous Weather, and No Accidents.

Anyone who was of the opinion that the public do not take an interest in aviation must have received rather a nasty shock if they went to Hendon on Saturday and saw something in the region of 40,000 people packing the enclosures for about three-quarters of a mile.

The whole performance was a huge success, and every credit is due to its organisers. Naturally the usual proverbial carping critic will find fault with some of the arrangements, but as practically the whole of the organising work fell on four men, namely, Messrs. Grahame-White, Richard Gates, Bernard Isaac and Capt. Tyrer, it is rather much to expect absolute perfection, and there are some people who will grumble when they get to Heaven because their halos do not fit. However, none of the competitors themselves made any complaint, and the huge crowd seemed thoroughly enthusiastic, and, after all, those two sections are the people who matter most.

The proceedings opened with a speed handicap, which was flown in what looked like a flat calm, though in reality there were some very funny currents in different parts of the aerodrome. The first heat was won by Mr. Raynham (1 min. 29 secs. start) on the A.B.C. Burgess-Wright, his flying time for the four laps being 7 mins. 43 secs. Mr. Lewis Turner, on a new Grahame-White biplane (with 2 mins. 12 secs. start), was second, doing 9 mins. 1 sec. M. Verrier, on the Maurice Farman (from scratch) was third in 6 mins. 55 secs.

In the second heat Mr. Sopwith was on scratch, giving Mr. Hamel 30 secs. and Mr. Cody 48 secs. Mr. Sopwith caught both Mr. Hamel and Mr. Cody at the end of two laps. Mr. Sopwith, getting mixed in his counting, came down at the end of the third lap, and Mr. Hamel, seeing it was useless to go on, gave up the race. In landing Mr. Sopwith bumped heavily on a rough place, and struck his propeller tip against the ground, breaking a piece off it. Various officials signalled him to go on to complete the course, but feeling the jumping of the unbalanced propeller, he came down at the end of the straight, leaving Mr. Cody to finish alone, which he did in 7 mins. 12 secs.

In the final of eight laps, Mr. Raynham won in 15 mins. 30 secs., having 5 mins. 2 secs. start. Mr. Turner was second, doing 17 mins. 49 secs. with 6 mins. 28 secs. start, and Mr. Cody, who was set to give Mr. Turner nearly three laps' start in eight, had pulled back two laps when Mr. Raynham finished, so he did not complete the course. Mr. Raynham is exceedingly popular among those closely in touch with aviation, for his quietness and modesty are becoming proverbial, and his subsequent behaviour was quite typical of him, for instead of remaining at the aerodrome and posing as a popular hero, he waited to see the finish of the "Circuit of London" and then quietly flew back to Brooklands. Near Hounslow a pin came out of a valve rocker, so he came down in a field, replaced the pin, did a few circuits to entertain the crowd which had gathered, and then flew on to Brooklands, where he proceeded to give instruction to some of the Sopwith school pupils as if nothing out of the ordinary had occurred.

Mr. Sopwith, the first man home, on his 70-h.p. Blériot.

The Big Race.

After the speed handicap, the machines were got out for the big event of the day, and the promptness with which the race was run may be gauged by the fact that it was advertised to start at 4.15, and the first man actually started at 4.39, which would be commendable punctuality in any form of sport.

The competitors went off in the following order:—Mr. Sippe (50-h.p. Hanriot mono.), Mr. Sopwith (70-h.p. mono.), Mr.

Mr. Raynham, on the Burgess-Wright with A.B.C. engine, winning his heat of the Speed Handicap.

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Whit Monday	BROOKLANDS CROSS-COUNTRY SPEED HANDICAP, 2nd Heat	A.B.C. FIRST
Whit Monday	BROOKLANDS CROSS-COUNTRY SPEED HANDICAP, Final	A.B.C. FIRST
June 8	HENDON SPEED HANDICAP First Heat	A.B.C. FIRST
June 8	HENDON "SHELL" TROPHY Final	A.B.C. FIRST

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The Non-starters.

Mr. Cody, who told me that he received a very bad knocking about when coming over from Aldershot in the morning, elected not to start. Lieut. Porte had some delay with his engine at Brooklands, and consequently did not arrive till the others had all gone. Mr. Nardini started from Deal, but only got a short way towards Hendon. Mr. Busteed also had engine trouble, and did not get away from Brooklands. Mr. Hucks had burst the tyres of the Nieuport in the morning, and so could not start. Mr. Bell was not available for the other Blériot. M. Moineau did not bring the Bréguet over from France. Mr. Lawrence could not get his Blackburn tuned up in time, and Mr. Lewis Turner wisely judged the stormy condition of the air too much for the ordinary box-kite type of machine.

The first report of progress came from Kempton, at which point Mr. Sopwith was leading, with M. Guillaux only 3½ mins. behind him. Soon after this news came in I was progressing along the front of the enclosures with Mr. Richard Gates, who was giving information to the crowd through a megaphone, and, incidentally suffering tortures from neuritis which would have laid anybody else up in bed, when somebody in the front row of the crowd shouted, "Here's the first man coming back," and a minute or two afterwards Mr. Sopwith came into the aerodrome, as usual, flying low, and made an excellent landing, his time for the 81 miles being 83 mins.

As he climbed out of his machine, he told me that he was not very sure whether he had actually gone the course, as there was so much mist and rain South of the Thames that he had not actually seen the turning points at Purley and Purfleet, though he had purposely flown wide to make sure of getting round them. He was promptly seized and chaired to the enclosure, for, after all, he was the first man round, even if it does turn out ultimately that he was missed by the observers.

Sixteen minutes later Mr. Hamel and Miss Davies came in sight very high up, and also made an excellent landing. Then there was a wait of 24 minutes and Mr. Moorhouse arrived, reporting that when he turned at Purley he had seen M. Verrier apparently heading for Dover. He, like Mr. Sopwith and Mr. Hamel, reported very bad weather, and Mr. Sopwith said that passing round Erith he had to come down to the height of the factory chimneys in order to see the ground at all through a rain storm. Thirty-eight minutes later Mr. Valentine arrived, reporting that his compass had broken loose after crossing the Thames, and he had to come down at Harlow, in Essex; when he came down he was actually in front of Mr. Moorhouse, who had apparently taken the wrong compass course after turning at Purley, and gone south as far as Sevenoaks before turning up for Purfleet, and he told me afterwards that he passed over Mr. Valentine, and recognised the machine on the ground.

The times in tabular form of those who finished are:—

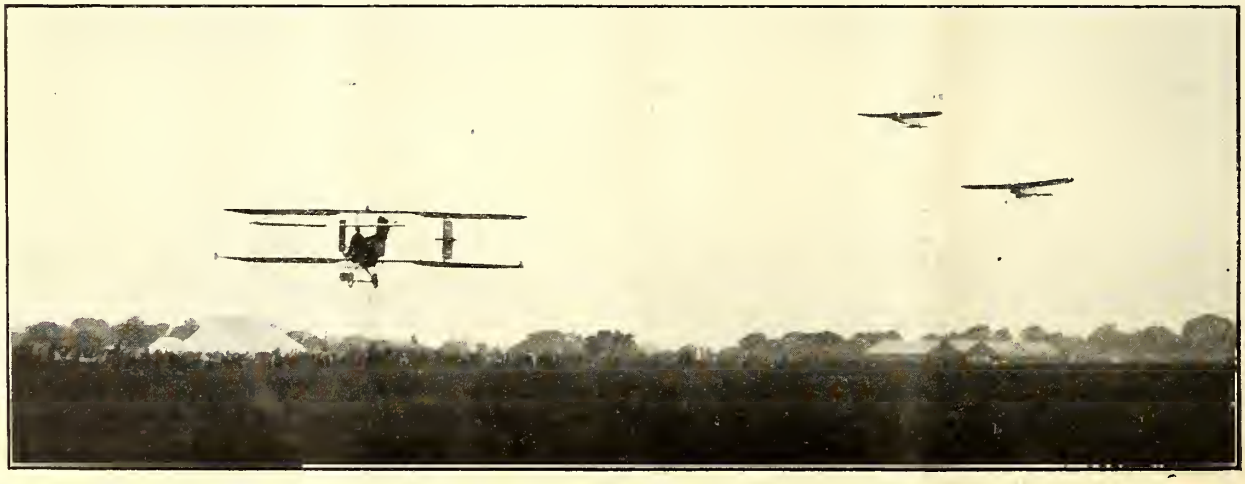
Mr. Sopwith,	started	4.39 p.m.,	finished	6.2.8 2-5
Mr. Hamel	,,	4.40 p.m.,	,,	6.18.46
Mr. Moorhouse	,,	4.42 p.m.,	,,	6.42.22
Mr. Valentine	,,	4.44 p.m.,	,,	7.10.39

Mr. Sopwith, the first arrival, being "chaired" in to the Enclosure, Mr. Grahame-White being chief bearer.

Thus all those who actually finished are accounted for. Shortly after Mr. Sopwith had arrived a number of spectators and officials said that they saw a machine coming over from Barnet which disappeared behind the trees, and it was not till a long time afterwards that Mr. Hamel appeared. It was discovered somewhere about 8 o'clock that the mysterious machine was M. Guillaux's Caudron, who had run out of petrol just before getting to Barnet and had been forced to come down. This was extremely hard luck, because the little machine was obviously almost as fast as Mr. Sopwith's Blériot, and if M. Guillaux went the correct course, which seems rather doubtful by the observers' reports, he would have won, in the event of Mr. Sopwith being disqualified, or would, at any rate, have put up an extremely good show. Even as it is, his performance stamps the machine at once as one of the fastest in the world, and the performance shows that M. Guillaux is undoubtedly entitled to take his place in the first rank of pilots. Mr. Ewen, with his head still in bandages, was an interested spectator—with one eye—of the race, and was naturally very anxious about M. Guillaux's fate. He may, however, console himself with the fact that there is nothing else in this country at present that could have done the same performance with the same horse-power.

Also very late in the evening it was learned that Mr. Sippe had come down between Coulsdon and Merstham through his Gnôme failing, and it should be noted that the fact of his being passed by the other machines before reaching Esher was also due to the engine, which refused to turn the propeller with which he had been doing such good flights on the same machine in France. It was quite noticeable that the machine was very sluggish in lifting and climbing, and altogether unlike the true form of the modern Hanriot, so that he may be expected to do a fine performance before very long.

M. Verrier apparently followed the course as far as Purley, and then, despite his English passenger, got irretrievably lost, so that eventually he came to the sea, and was then convinced



Mr. Cody (on left), Mr. Sopwith (centre), and Mr. Hamel (right), in the Speed Handicap. Mr. Sopwith is just about to pass the other two.

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that he must be wrong somewhere, so he turned back, and by some wonderful stroke of luck got to Hounslow, where he landed just before Mr. Raynham, who also landed there on his way back to Brooklands. After a short stop he did a very clever "get-off" from some long grass, arriving back at Hendon just on 9 p.m., coming down with one of his usual splendid glides.

M. Verrier's passenger was a photographer for one of the illustrated papers, who has already done quite a large amount of flying, so it is rather extraordinary that he should have lost his way.

In the Meantime.

While the competitors were away some excellent exhibition flying was done by Mr. Sabelli on the little 35-h.p. Deperdussin, Mr. Weir on his Blériot, and by Messrs. Grahame-White, Noel, and Lewis Turner on the Grahame-White biplanes, and after the finish of the race Mr. Hamel and Mr. Sopwith also did quite a large amount of passenger-carrying, in spite of their hard day's work. At the finish of his last flight Mr. Sopwith landed rather too close to the sheds, and ran into Mr. Porte's two-seater, fortunately without very disastrous results.

It is worthy of note that Mr. Sopwith flew the race with a propeller intended to fit the 70-h.p. Nieuport and borrowed from Mr. Grahame-White to replace the one he broke in the speed handicap. One of his first actions on his return was to shake hands with his chief engineer, Mr. Sigrist, and thank him for the way his engine ran.

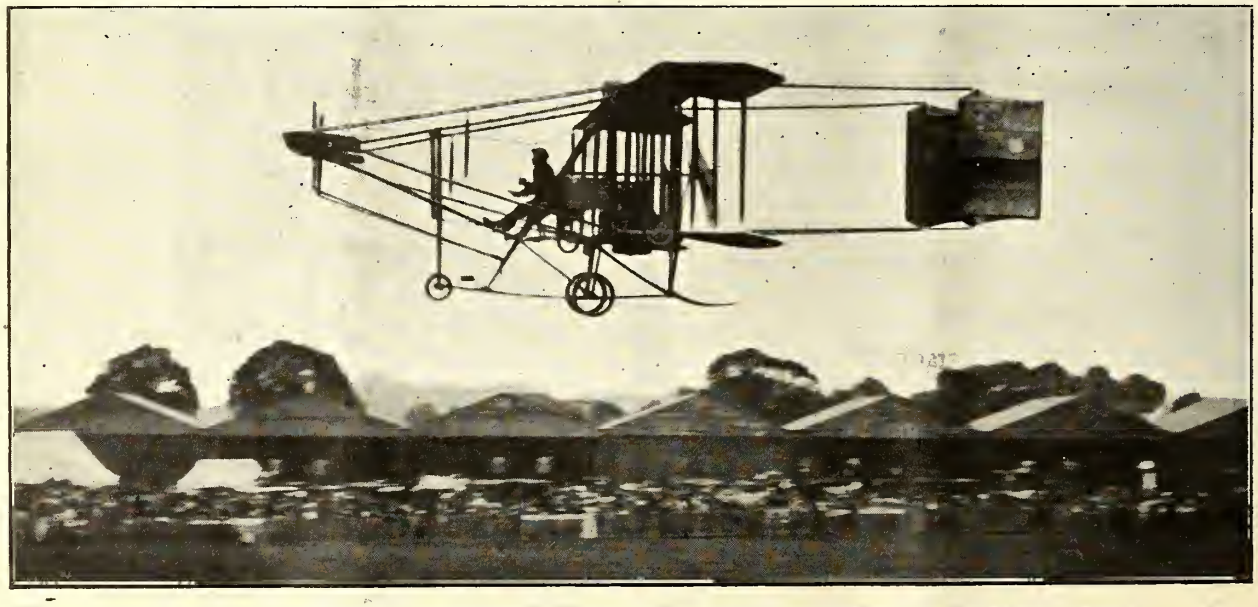
Naturally one thought that Mr. Hamel was rather throwing away his chances by flying a passenger machine, but having tried the 50-h.p. Blériot which he flew across the Channel recently, he found that it was slower than Miss Trehawke Davies' two-seater, even carrying a passenger, so he elected to fly the bigger machine, and took the sporting owner with him.

Quite late in the evening Mr. Cody started back for Aldershot with Lieut. Parke, R.N., as passenger, and Mr. Parke told me next day that they had quite a delightful journey, flying at about 200 ft. all the way in nice steady air, but I am afraid Mr. Cody was not at all pleased with his day's work, or with the handicappers who asked him to give three laps in eight to a biplane which was noticeably faster than a similar machine against which Mr. Cody had competed at a previous meeting.

However, taking it all round, the meeting was a very great success, and it is to be hoped that the Grahame-White Aviation Co. will manage to put up other races which will attract public attention in the same way. As a matter of fact, it would not be a bad idea to put up a prize for a race from Hendon to Birmingham and back, and, of course, what would probably impress the public more than anything else, and would show the progress aviation has really made since Mr. Grahame-White's fine attempt two years ago, would be a race from Hendon to Manchester and back in the day. Could not some of our sporting newspaper proprietors be induced to put up a really suitable prize?

M. Verrier on the Maurice Farman in the Speed Handicap.

At the moment of writing it is still uncertain whether Mr. Sopwith followed the course at the Purley turning. It is certain that one machine turned between Purley and Croydon, and it is possible that this may have been M. Guillaux. At any rate, the observer there only saw six machines, of which Mr. Hamel's was the second. So the first two actually to pass must have been Mr. Sopwith and Mr. Guillaux, one of whom passed inside the turning point, the other apparently turning outside while the observer was watching the machine between himself and Croydon. Both M. Guillaux and Mr. Sopwith were in front of Mr. Hamel till the former came down near Barnet, and neither were positively identified at Purley. Any evidence on this point will be welcome, and spectators who were located to the south



Mr. S. F. Cody flying his Green-engined "Circuit" and Michelin Cup biplane in the Speed Handicap.

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of Purley will be doing the sport a service if they will communicate what machines they were able to identify, either to this office or to the Royal Aero Club, as there is still doubt whether Mr. Sopwith was legally disqualified or not.

In any case, all four pilots who finished such an extremely difficult race deserve every congratulation, for the country is as bad as it can be for cross-country flying, being short of landing places and devoid of landmarks, while most of the time the weather was not only uncomfortable but dangerous. It is to be hoped that most of the people who saw them compete will honour them by coming to Hendon on the 22nd, when they will receive their prizes from Lord Lonsdale—if the winner has been decided by then.—C. G. G.

Impressions of the "Flying Derby" at Kempton Park.

On leaving Farnborough on my motor bicycle at about 2.15, I caught a glimpse of Cody flying strongly *en route* for Hendon. A large crowd gathered in the neighbourhood of the square chimney near Sunbury Station, the principal vantage point being the adjacent bridge over the railway, which was crowded with motor cars, motor bicycles, bicycles, and foot people, the police having hard work to keep the road clear. There seemed to be very little wind low down, but the direction of the smoke showed that there was a certain amount of south-westerly wind higher up. The delay in the arrival of the competitors only whetted the appetite of the crowd, and the rumour that the race was abandoned, started by some irresponsible juggins, caused nobody to move.

When at last a monoplane was discerned flying low over the tree tops, the excitement was intense. When the Blériot passed 200 or 300 ft. up, and it was seen to be Sopwith, the satisfying "He's an Englishman, anyhow," was heard and a cheer was raised. Guillaux and Hamel arrived almost together, as did Sippe and Moorhouse. The latter created great astonishment by shutting off his engine and planing down on nearing the chimney, presumably to be sure of having his number read.

These monoplanes flew higher than Sopwith, and the crowd resented this, because it was almost impossible to read the numbers, even with strong field glasses. The idea of safety in height perhaps did not occur to it.

Verrier's box-kite Farman, which followed, seemed to be flying splendidly, and was apparently almost as fast as the monoplane. Valentine followed the Farman, flying well.

Cody was, of course, the popular hero, and it was a great disappointment when the minutes passed and he did not arrive.

It was undoubtedly a sight worth going many miles to see, and the crowd greatly appreciated the wonderfully smooth, steady way the machines made straight for the chimney, swung round it with beautifully banked turns, and passed overhead and out of sight.

There are just a few things which would have made the interest even greater. Firstly, if telephonic communication could have been established with Hendon and the progress of the race announced by megaphone. The cost might have been borne by having an enclosure, and I think many people would have paid 6d. or 1s. to go in and get this information. Then the numbers might have been larger and put on with white paint, to make them easier to read.

Although a minimum height regulation would perhaps have made the race fairer, the low flying was essential from a spectacular point of view. I was disappointed that there was no tractor biplane in the race. Although appearances are deceptive, I do not think any of the monoplanes flew faster than *B.E.2.* does at Farnborough. I should like to have seen de Havilland on *B.E.2.* leading the van.

I then made for Hendon to see the finish and arrived about ten minutes after Sopwith descended, experiencing great difficulty in getting into the aerodrome. I noticed a great crowd on the hillside of people getting "something for nothing." It was a pity Grahame-White could not have sent some "strong men" round to collect with a landing skid—in lieu of a cricket stump!

On my way back I saw Cody returning to Farnboro', flying very fast. It was a great pity he did not compete and annex the £50.—An Observer.

Notes from Purfleet.

Arriving at Purfleet at 1.30 p.m., I made for the Royal Hotel (which was, according to the official conditions of the race, one of the turning points, and known as No. 4).

A short interview with the genial proprietor (Mr. Watson), and the presentation of the current copy of The Aeroplane, was sufficient to secure a place on the roof of the building in order to obtain the best possible view. In view of the unpropitious weather conditions I was fortunate enough to secure the advice of a river tug pilot for this part of the Thames, who assured me that the mist that was then in the locality would very soon disappear. As there were, apparently, none of the officials about the village at this time, and thinking that those most concerned would desire to know the condition, I claimed the only 'phone in Purfleet, and it took exactly 35 precious minutes to get through to "Kingsbury 22 or 92," where I gave: "Weather misty, lifting slightly; no wind; no rain."

Mr. Richard Gates, Certificated Aviator, the clever organiser who is manager of the London Aerodrome.

The first machine to be seen (query as to which and whom) was noticed on the Kentish side of the river at 5.24 p.m., and was flying miles out of the course, eventually turning out to the river, and was last seen travelling in the direction of Grays (Essex). [Presumably M. Guillaux.—Ed.] Close upon this was a second machine, type unknown at the time as it was too far away to note her build, crossing the river at a tangent and making for a point 2½ miles to the east (or thereabouts) of Purfleet. Time, 5.29 p.m. Within a few minutes—probably three or four—this machine was seen making for Purfleet, pilot having picked up his course, and flying high and following his true course from turn 4 (Purfleet) to turn 5 (Epping) was not so much out of the race as first appeared. It was here that I was able to chance a decision in my own mind—noting that the machine was a Blériot and of high power. That same was "No. 2, Sopwith," but I make no definite statement in this respect.

A matter of some few minutes' wait provided us with the "star turn" in the person of Mr. Hamel, who, breaking through a none too clear atmosphere on the south side, and flying at probably 1,200 ft., after crossing part of the river immediately facing the hotel, gave rather a sensation to the public by doing a graceful *vol plané* down to about 800 ft. and made a very cleverly judged turn of the hotel. The exact time that Mr. Hamel passed this point was 5.38 p.m., Greenwich time, altitude 800 ft. It was not until the first round of cheers had subsided, and the first flush of excitement had toned down,

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that the public realised that the aviator was Mr. Hamel, who was carrying a passenger—Miss Trehawke-Davis, to wit. Their names (I speak now for voice of "the-man-in-the-street") are household words, but I must ask you to make known the fact that Mr. Gustav Hamel is a British subject, as there is a great deal of doubt on this question by people interested but not quite assured. [He is British-born and a Westminster School boy. His father was one of the doctors to his late Majesty, King Edward VII.—Ed.]

The next machine that came in view (I claim to be an easy first to have picked this out) proved to be No. 8 (Radley-Moorhouse, Moorhouse up), flying at about 800 ft. This was visible to the people for the greatest time of any. The evolutions of the *vol plané* (to conform with the regulation respecting flying within a reasonable height for observation) and the fine turn of the course, added to the fact that it became known that yet another Britisher "knew how to fly," brought forth a round of cheering that I shall hear for a long time to come.

In the midst of this came the appearance of another machine, flying rather low and taking the river course down stream. This was Valentine on the Bristol (No. 14). He was certainly chasing Moorhouse, and this, added to the fact that the crowd got to know that yet another Britisher knew how to fly, produced an echo of cheering that only an enthusiastic British crowd can supply.

I would ask you that, in any general report or article you publish respecting the first Aerial Derby, to particularise on the performances of the Britishers in the race and the appreciation of the public, and thus remove the stigma that has so long rested on this nation in respect to its lack of interest in aviation.—"Hamlet."

From Barnet.

The observer of the "circuit" at Barnet writes that the first competitor to come in sight was Mr. Sopwith, flying at about 300 ft. and going well. Fifteen minutes afterwards Mr. Hamel was seen very high up. He shut off his engine and planed down to about 500 ft. to pass the control. Twenty minutes later Mr. Moorhouse also arrived high up and came down to about 400 ft. at the turn. Mr. Valentine was wide to the east when he appeared, but came closer to pass the observers. Messrs. Barr, Lambert, and Sanderson, who were observing, wish to tender their thanks to Mr. Wood, the stationmaster at Barnet, who allowed them to use the roof of the station as an observation post, and his wife, who entertained them to tea.

One Point of View.

One of the spectators at a point of vantage reached from the East-end got impatient when nearly half an hour passed after the first aeroplane was due, and stated to those within hearing: "This ain't no blooming Derby, it's a Hoaks!"

About the Mersey Monoplane.

The Mersey monoplane, which has been flying so well at Freshfield lately, is illustrated in the present issue of The Aeroplane. As may be seen, the machine is quite an original type, having the engine in front and the propeller behnid, so that there is practically a clear field of fire for the passenger. The span of the machine is 35 ft., and the area 200 sq. ft. Without pilot and fuel she weighs 750 lbs., with a 45-h.p. Isaacson engine. On various occasions in still air she has been timed to do 68-70 miles an hour, so that it would be safe to say her speed was 75 miles an hour.

The Mersey monoplane recently had her first accident through Mr. Fenwick, the pilot, landing on what he thought was hard sand, but was in reality quicksand, so that the chassis sank in and the machine turned over. Mr. Fenwick was thrown clear, and the only damage was to the propeller, the tail of the body, and a few ribs in the wings, and the machine should be out in about a week's time from now.

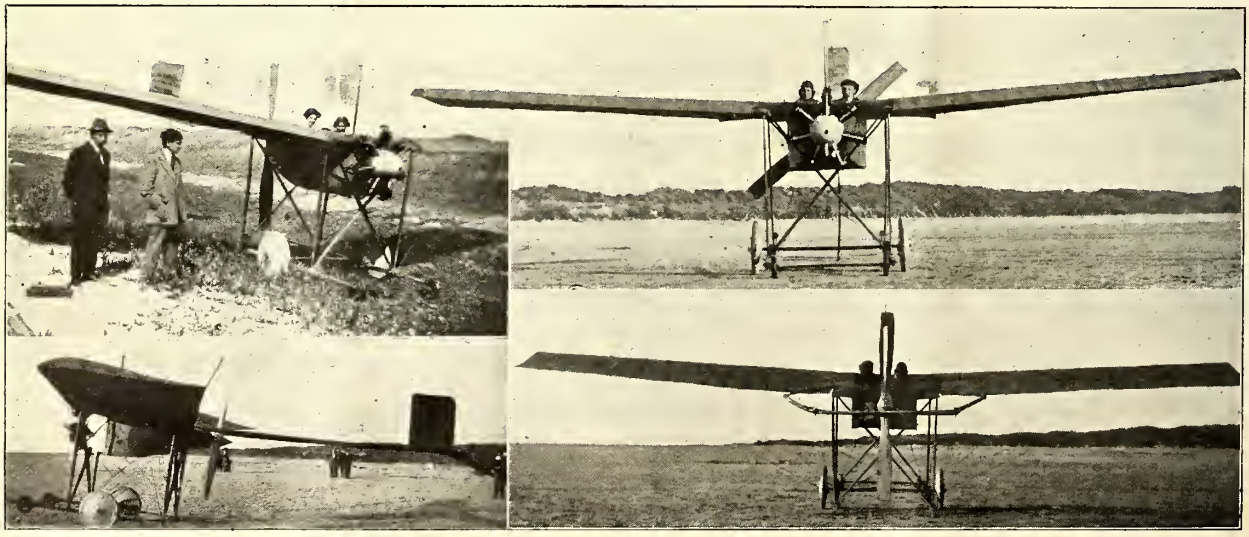
Flying in Ireland.

During the past few weeks Mr. D. Corbett Wilson, of Darver House, County Kilkenny, has been doing quite a large amount of good flying on his Blériot. On the Friday before Whitsun Mr. Wilson left the polo ground at Jenkinstown and flew over the City of Kilkenny at a considerable height. On the Whit-Monday morning he was out again at 4 a.m. and again went over the city, and on the Tuesday evening he made the same trip again, but over a bigger circuit. Recently Mr. Wilson gave a flying exhibition at Ardaloo, which was highly successful, and was viewed by many thousands of people; and, to quote the *Kilkenny People*, in which a thoroughly excellent account of the performance appeared, "It only remains to be added that, being as generous as he is plucky, the entire gate receipts, which must have reached a considerable amount, are to be devoted to local charitable purposes."

Lieut.-Col. Butler Kearney writes further of Mr. Wilson's flying as follows:—

"Ireland is a country famous for many things, and notable for many more, and Kilkenny is, *par excellence*, the most notable county, famed for its smokeless chimneys, its cats without tails, and its streets paved with marble.

"But there are other things of which Kilkenny can boast prominence. The late Lord Carlingford resided in Kilkenny, and about fifty years ago invented a flying machine, and actually made a short flight on it. The machine was very much like the monoplane of to-day. The body was boat-shaped and made of split bamboos; wings and a propeller, with two blades, in front, worked by a hand lever operating on cog-wheels. Had Lord Carlingford lived longer it is possible, in view of the immense strides made in aviation within the past few years, that the conquest of the air might have taken place many years earlier than it has done. Lord Carlingford's machine is mentioned in Lady Dorothy Nevill's memoirs, 'Through Five Reigns,' in a letter therein quoted.



The Mersey Monoplane with an Isaacson Engine—a promising type for military purposes, giving a clear view in front. On the left are Messrs. Swaby and Fenwick, the heads of the firm, Mr. Fenwick being the pilot.

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The Mechanics of the Aeroplane.
By CAPTAIN DUCHENE. 7s. 6d.

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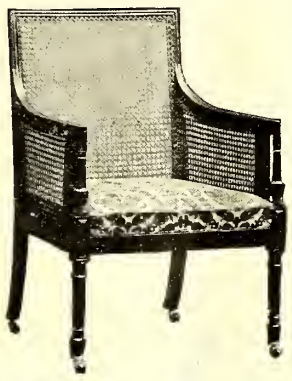

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ALL BRITISH

"In the present day Kilkenny can again boast of the first flying machine to be introduced into the country, the well-known aviator, Mr. Denys Corbett Wilson, the first man to fly to Ireland from England, having his machine, a Blériot monoplane, located at his home in that county. Mr. Wilson started from the neighbourhood of Fishguard some time last April to fly to the Wexford coast, a feat which he successfully performed, landing at Enniscorthy. Having been obliged to land in a fog, his machine sustained some damage, coming in contact with a fence which he did not see. As soon as the necessary repairs were effected, he flew to Kilkenny and, curiously enough, alighted in a field (the polo ground), the property of Mr. Swifte, son of the Lord Carlingford aforementioned.

"Mr. Wilson in May flew back to Enniscorthy, a distance of 35 miles, accomplishing the journey in 20 minutes, an average speed of 105 miles per hour. The next day he flew there in aid of a local charity, and his flight was witnessed by an enormous crowd. The charity (at a moderate fee for entrance to flying ground) benefited to considerably more than £100. The flight at Enniscorthy was made under very unfavourable circumstances: the wind was high and, from the nature of the country, very unsteady. The crowd was so great that Mr. Wilson had to pass over the flying ground and alight outside.

"The following week he again kindly flew for a local Kilkenny charity, and again gave a most excellent exhibition, the charity in this case being benefited to the extent of over £51, only a very small fee being required for admission to the ground, and over 3,000 spectators beng present, a most enthusiastic and orderly crowd.

"Mr. Wilson flies from the polo ground nearly every evening, and has perfect control of his machine."

One of the local sportsmen was so moved that he burst into verse thusly:—

THE FLIGHT AT ARDALOO

By Patrick Connor, Prospect.

'Twas on the 23rd of May, and in the afternoon,
That Mr. Corbett Wilson went up to see the moon;
Right well he done when he begun, with courage bold and true,
He soon was far above us from the fields of Ardaloo.

The field it was a splendid one, no better could be found,
And I was told by many it was once a polo ground;
But never could the stick and ball, or man with helmet blue,
Bring half the crowd that cheered so loud that day at Ardaloo.

'Twas half-past three when I arrived--the place it seemed alive—
But I was sorry when I heard he wouldn't fly till five;
I roamed about from field to field—I'd nothing else to do
But wait and see that splendid flight that day at Ardaloo.

I went down to the hangar, or, rather, to the nest,
Where this great bird was covered up and peacefully at rest;
The canvas soon was taken off to let us have a view
Of the great machine that ne'er was seen before at Ardaloo.

At last 'twas wheeled out to the field amidst a silent throng,
All eyes were fixed upon it as it quickly raced along;
It gradually ascended, just like a big cuckoo,
And flew for miles around us that day from Ardaloo.

Some people murmured: "If he fell!" but someone said:
"Ah, no!
While life and pluck with him remain he'll always give a show";
For none but Him Who rules the earth, and can the storms subdue,
Could shake the nerve of that brave man that day at Ardaloo.

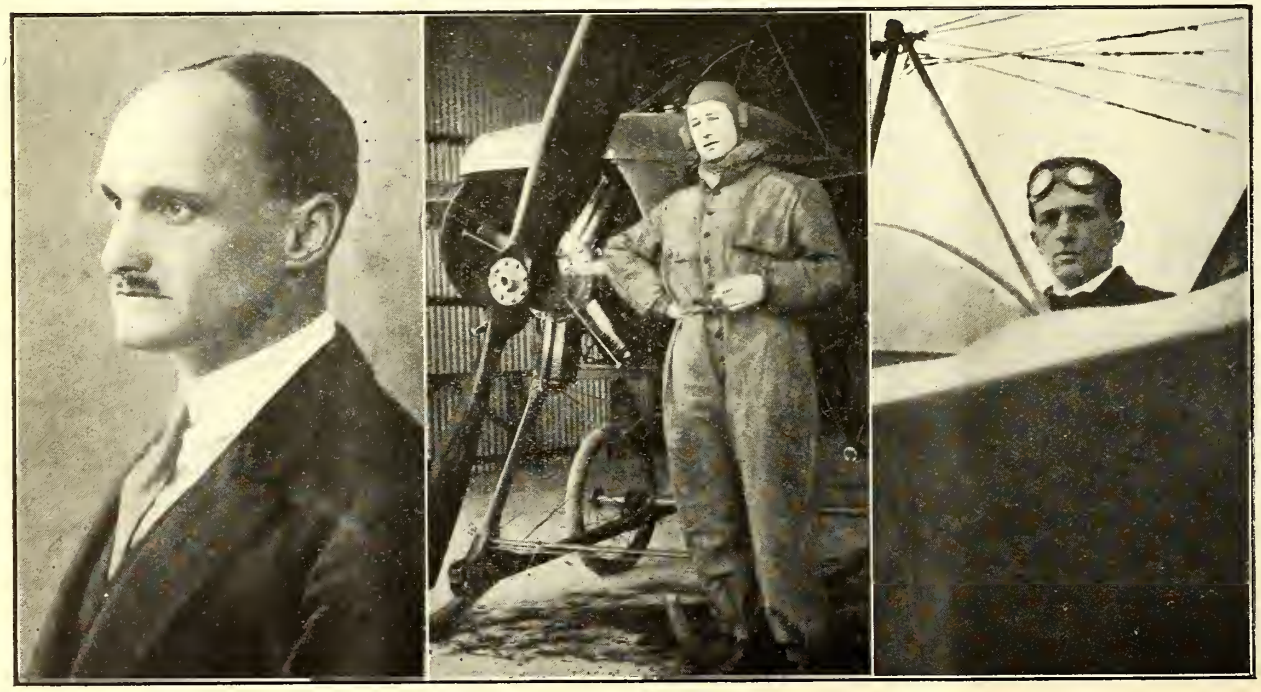
Kilkenny always held its own with all that came the way,
But now, through Mr. Wilson, it proudly takes the sway;
You know he is the first great man that o'er the Channel flew,
And landed down in Wexford, not far from Ardaloo.

Long life to Mr. Wilson, may his courage never fail,
May a hundred years pass over ere his coffin needs a nail;
May the God above protect him, and bring him safely through,
To give us all another show some day at Ardaloo

Not the least astonishing part of the progress of aviation in Ireland, as assisted by Mr. Corbett Wilson, is the extremely thorough way in which the local papers, from which cuttings have been kindly sent to The Aeroplane, deal with the subject. Their accounts of Mr. Wilson's flights, both in commonsense and literary style, leave far behind any London daily paper, from the biggest downwards, which has yet touched the subject.

Good Work at Brooklands.

On Wednesday, June 6th, Mr. Dennis Arthur, who was the first passenger to go up in an aeroplane in Ireland, took his brevêt in the Bristol two-seater monoplane at Brooklands. The previous day he started to get it and promptly went up to 2,000 ft., at which height he performed about three figures of eight, but being so high he could not distinguish the turning points, and had to be waved down. The next day he



Two new Pilots and their Instructor. Left to right, Captain Becke, Mr. Hotchkiss—chief of the Bristol Brooklands School—and Mr. Dennis Arthur.

went again and stopped climbing at 500 ft., keeping that as a steady average height, and as near as possible the exact course for each turn, landing some 50 yards from point. The second part of his test was even better, for he kept the same height and course as first, and landed right on the mark. Considering that Mr. Arthur had only been solo flying on the Bristol Anzani monoplane for less than three weeks this excellent performance on the two-seater monoplane throws into prominence once more the Bristol Brooklands School, showing that the excellence of instruction is being kept up by Mr. Hotchkiss. His teaching is of the right sort to enable pupils to secure their brevêts.

A second brevêt last week was that of Captain Becke, who got his brevêt on Friday evening on a Bristol biplane. He took 20 mins. for each set of five figures of eight, and flew a beautiful course. This pilot has been at the Bristol School under three weeks, and has now left with a grounding which should make him a first-class pilot, judging from the way he flew for his brevêt.

The Royal Flying Corps.

Captain H. R. M. Brooke-Popham, Oxfordshire Light Infantry, has been appointed to the command of an aeroplane squadron to be stationed at Lark Hill, Salisbury Plain. Attached to this squadron will also be Captain C. R. W. Allen, Welsh Regiment; Lieutenants D. G. Conner, R.A., and Porter, R.A.—W. E. de B. W.

The Central Flying School.

Quite good progress is being made with the buildings for the Central Flying School on Salisbury Plain. The permanent offices are practically finished, and a number of sheds are well on the way towards completion. Evidently the War Office mean to do things thoroughly, for the buildings are very solid in construction and design.

The Farman Hydro-Aeroplane.

M. Henry Farman has during the last few days satisfactorily completed at Buc the trials of the Farman hydro-aeroplane ordered for His Britannic Majesty's Navy.

Mr. Barber's New Work.

Mr. H. Barber, who will always be remembered as one of the pioneers of aviation in this country, and especially as the designer, constructor, and pilot of the Valkyrie monoplanes and Viking biplane, has now opened an office at 59, Pall Mall, where he is acting as a consultant on all matters concerning designs and construction of aeroplanes. His services are purely professional, and he has no trade interest of any kind. He is prepared to give opinions and make reports on aeroplanes for any constructor, and is also prepared to supervise the construction of machines. In this latter department he is particularly well worth consulting, for the Valkyrie and the Viking have always been recognised as among the very best built machines ever turned out, and one can have no hesitation in strongly recommending those who are thinking of building experimental machines to consult Mr. Barber before spending money on their pet ideas.

An Experience on an Adler.

There are certain names in the history of motoring which stand pre-eminent, and high among them is that of Adler. This firm has held the reputation from the days of its formation of using exceptionally fine material, and no reputation of this kind can be gained without a solid basis of fact.

Some weeks ago I had to visit Salisbury Plain, and as the trains started at inconvenient times I borrowed an Adler car from a friend for the journey. The distance from London to Amesbury is about 81 miles; there was a high wind against us, and the car had only 10 horse-power. Yet through the entire day the engine ran without a falter, and the speed was sufficiently high to annoy even an honest policeman, if there be one. I had with me two passengers, one of whom was large and lumpy. Even so, I had rarely to change speed, and on no occasion was it necessary to come down to first speed. The rough surface of the Plain itself made but little difference to the comfort of the passengers owing to the excellent springing of the car.

The only untoward event of the day was the unintelligent behaviour of a tyre, which, under the influence of accumulated heat, shed the great part of the tread. To readjust matters we had, therefore, to stop at Andover on the return journey. Beyond this there was no delay.

The total mileage covered in the course of the journey was about 200 miles, a long journey for a 10-h.p. car carrying such heavy weights. Yet, notwithstanding the considerable putrescence of the roads, the car itself required no attention whatsoever. The pressure-fed lubrication system is excellently designed and gives no trouble at any time. Any failure on its part is immediately indicated to the driver by the cessation of pulsation on the part of a piston indicator on the dashboard. The gear-box has four speeds and reverse operated by a single lever in a gate. Changes of speed can be made easily.

The four-cylinder engine has a bore of 65 mm. and a stroke of 98 mm. The R.A.C. rating is thus 10.5 h.p. The normal revolutions are 1,800.

The car is very suitable for the use of Service or civilian aviators, as the excellence shown in the selection of material and in the execution of a good design is a sufficient insurance against any collapse under the stress of aviation work; and, owing to low petrol consumption and light weight, the running expenses are very small. The body work by Morgan and Co., Ltd., is naturally beyond reproach.

The Gilmour Memorial.

The active collection of further money for the memorial to the late D. G. Gilmour has now ceased, and a meeting of the committee which is dealing with the funds will be held to-day. Those subscribers whose names have appeared on the lists published but who have not yet sent in the amounts subscribed are requested to do so as soon as possible, so that the accounts may be closed. Also, those who have been making local collections will greatly oblige by sending in the final collections. The fund at the moment stands thus:—

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Amounts already acknowledged	178	0	6
Per Mrs. Handasyde (collection from the Adams Motor Works, Bedford, £1 15s.; Jack England (Argentina), £1; Alex. Lang, 10s. 6d.; W. A. Trier, 10s. ...	3	15	6
Per Mr. Charteris (balance of the recent collection at Brooklands for a wreath for the late E. V. B. Fisher)	0	6	6
Lieutenant T. H. Sebag-Montefiore ...	1	1	0
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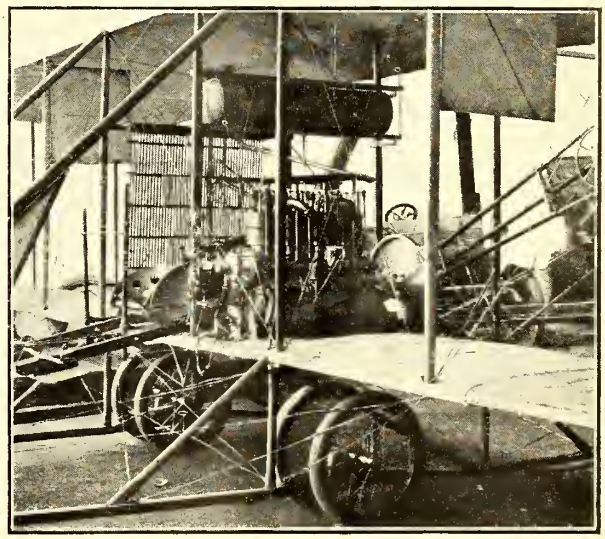
The Dunne Monoplane to the Fore.

In the Eastchurch reports of the "Week's Work" it is noted that Captain Carden, R.E., took his certificate last week on the Dunne biplane. His is the first certificate taken on this machine, and one hopes that it may be the beginning of a series of further successes on this highly original machine. That the ideas embodied in the machine are appreciated by those who have studied aerodynamics is proved by the fact that the great French Astra Company have just arranged to build machines under the Dunne patents in France, and these machine should be worth watching, for expense will not be considered in their production, and very fine work should be turned out. One cordially wishes the Blair Athol Aeroplane Syndicate and Mr. Dunne a brilliant future.



The A.B.C. engine fitted to the Burgess-Wright on which Mr. Raynham has been so successful recently..

The Week's Work.

Monday, June 3rd.

Brooklands.—At Deperdussin School, early, Lieut. Gill out on racer for 15 mins. Machine handled in style reminiscent of Sabelli. Capt. Dawes afterwards doing straights, and Capt. Brooke-Popham rolling on taxi.

At Vickers School, Capt. Darbyshire out early on *No. 3*. Landing after straight flight chassis strut buckled and machine stood on nose. No serious damage.

At Sopwith School, Mr. Raynham out early on school Farman in fog. Mr. Hedley then alone for straights. Capts. Howell and Herbert receiving instruction.

Mr. Alcock out early on Mr. Ducrocq's Farman, rolling and straight flights. Windy evening, no flying.

Eastchurch.—Commander Samson flew the hydro tractor biplane from Burntwick Island to Harwich.

Hendon.—At Grahame-White School, in morning weather none too good, mixture of fog, remous, and ten-mile wind. Major Liles out first, doing circuits on Farman, followed by Mr. Roupell; then Lieut. Salmond, and Messrs. Wynne, Kershaw and Rathborne doing straights on Farman, and Baroness Schenck on Howard Wright. In evening, rain too heavy for flying.

At Blériot School, Mr. Weir determined to make most of time, out from 5 a.m., making little excursions over surrounding country, until about 8.30 a.m.; wind, however, somewhat too strong for pupils.

The Plain (Royal Flying Corps).—In morning, Capt. Loraine went for long flight on *F.8.*, making splendid landing from a good height. Afterwards took over Deperdussin, doing fine flight and landing with one of his fine spirals. The second trip took Capt. Heneage, of Field Artillery, as passenger, to test different signals attached to machine. Staff-Sergt. Wilson then went out on *F.8.* and did some very good solos.

Tuesday, June 4th.

Brooklands.—Windy early, no flying till evening.

At Deperdussin School, Lieut. Bourke rolling on taxi.

At Vickers School, Capt. Darbyshire making excellent straight flights on *No. 3*.

At Sopwith School, Mr. Raynham out solus on Farman in wind, later with Messrs. Hedley and Wadham.

At Spencer School, Mr. Spencer flew two or three circuits, one with passenger.

At about 6.30 p.m., Lieut. Barrington-Kennett landed on Nieuport, leaving within a few minutes for Windsor. Army Nieuport now seems very tired, and has completely lost perky tail attitude characteristic of Nieuports.

At Bristol School, Mr. Hotchkiss up early with Capt. Agnew for one circuit. Weather too bad for school work. At 5.30 p.m., Mr. Hotchkiss for solo, and when over river at about 70 ft. a very bad gust shot machine on its nose nearly vertical. He was just able to wrench her up when practically on ground, and only damage done was breaking of one strut and three or four wires. It was such a bad toss that all eye-bolts in main planes bent at their eyes. About 7.30 p.m., Mr. Arthur was started off on monoplane for brevêt. He flew off and rose to about 2,000 ft., and, of course, through being so high, could not distinguish his points, so had to be waved down to start again. The second time he flew four figures of eight, but mistook a signal and came down before completing his first test.

Eastchurch.—High wind, rain; no flying.

Hendon.—Morning hopeless for pupils—heavy showers with bright sun between, which surely means remous. In evening Grahame-White School busy, in spite of trickiness of air; Capt. Salmond doing straights with instructor; Mr. Kershaw straights solus, and Mr. Blackburn, the school's new pilot, testing old school machine. Unfortunately, he ran into a sheep and killed it, at the same time chipping the propeller so badly as to throw it out of balance, so that machine had to be returned to shed pending replacement. Meanwhile, Howard Wright busy, Mr. Turner taking passengers over surrounding country, and Messrs. Morris and Roupell learning new machine preparatory to getting brevêts.

The Plain (Bristol School).—Flying impossible in morning. Mr. Bendall out in evening testing No. 55, Mr. Pizey with lady passenger. Lieut. Fielding fine solo on No. 55, M. Jullerot with Lieut. Fox in two-seater, afterwards solus on same. Lieut. Ercole out for two trips on biplane. Mr. Lister great style for a circuit, landing well. Lieut. McArthur also for very good trip, landing nicely.

Waterloo (Liverpool).—Blériot two-seater out with Mr. Birch as passenger; Mr. Melly flying to Crosby and back along beach. East wind again proving too difficult to be amusing.

Windermere.—Mr. Duigan's Avro biplane, purchased by Lakes Flying Co., arrived and was rapidly erected to be fitted with Gnôme and floats.

Another view of the main block of sheds at Brooklands, taken from the Flanders Monoplane by Mr. Dukinfield Jones. In the distance is the famous Sewage Farm.

Wednesday, June 5th.

Brooklands.—Again no flying early.

At Avro School, Lieut. Parke, R.N., brought out Army Avro No. 2 at 6.30 p.m. Machine climbed to 2,000 ft. in a circuit and a half and then left for Farnborough, arriving safely in 23 mins.

At Sopwith School, Mr. Raynham out solus on Farman. Then with Capt. Alston. Stopped by broken petrol pipe. Repairing this, Mr. Raynham took Messrs. Herbert and Webb-Bowen for intruction.

At Deperdussin School, Lieut. Gill out for 15 mins. on racer. Lieut. Bourke on taxi rolling, when machine again caught fire. Capt. Dawes then making straight flights on racer. After a bumpy landing machine jumped fence and attempted to clear crates and packing cases at end of sheds. Machine being pushed up under flying speed took up an angle of 45 degrees with horizontal (both laterally and longitudinally) and then performed a cartwheel on one wing tip amongst the crates. Machine badly smashed, Capt. Dawes unhurt.

Mr. Pashley also out for short while on Humber monoplane.

At Bristol School, Mr. Busteed solo on biplane. Mr. Arthur then went for brevêt on two-seater monoplane. Flew at about 500 ft., keeping splendid elevation. Second figures of eight were flown at about same height, and he landed right on the mark to conclude. This is the first brevêt taken upon the Bristol Gnôme monoplane, and exactly three weeks after Mr. Arthur first taxied the Bristol Anzani monoplane. Considering flight he made two days previously at a height of 2,000 ft. over surrounding country, it is needless to comment upon the machine and school where he learnt to fly.

Mr. Hotchkiss then took Mr. Holyoake and was up again with Capt. Agnew. Capt. Becke did one figure eight and three circuits. Mr. Hotchkiss up again with Capt. Agnew, and finished evening with solo. Mr. Busteed made a short flight on two-seater monoplane after Mr. Arthur's brevêt. Mr. Lane flew four straight lines on Bristol Anzani monoplane, and Mr. Bettington rolled same machine for about 10 mins.

Barnstaple.—M. Salmet arrived from Exeter, but Gnôme giving trouble, so exhibition flights postponed. Spare engine from Paris reported to be of "wrong type," so further delays pending arrival of something different.

Eastchurch.—Wind all day. Lieut. Grey out on 70-h.p. tractor in evening, and Capt. Carden out on Dunne biplane.

Hendon.—Morning hopeless. In evening, pupils out from 7 to 9 p.m. Messrs. Wynne, Salmond, Rathborne and Scully doing straights with instructor; Mr. Kershaw straights solus, Mr. Morris circuits, and Mr. Hoelscher (new pupil), passenger straights on school Farman, Mr. Morris afterwards doing excellent circuits on Howard Wright, in spite of bad running of engine.

The Plain (Royal Flying Corps).—In evening, Capt. Loraine out on *F.8.* doing fine solos lasting for 15 mins. He then took up Staff-Sergt. Brockbank, who is promising pupil, and this flight last for ¾ hour. Capt. Loraine then took up another promising pupil, Staff-Sergt. Unwin, for 30 mins. Lieut. Fox, R.E., then did fine flight on *F.8.* for 15 mins. Staff-Sergt. Wilson took over *F.8.*, flying well for half an hour. Staff-Sergt. Brockbank, on *F.8.* doing rolling practice. Lieuts. Conner, Porter, and Corpl. Ridd out on *F.7.*, each doing some very good solos.

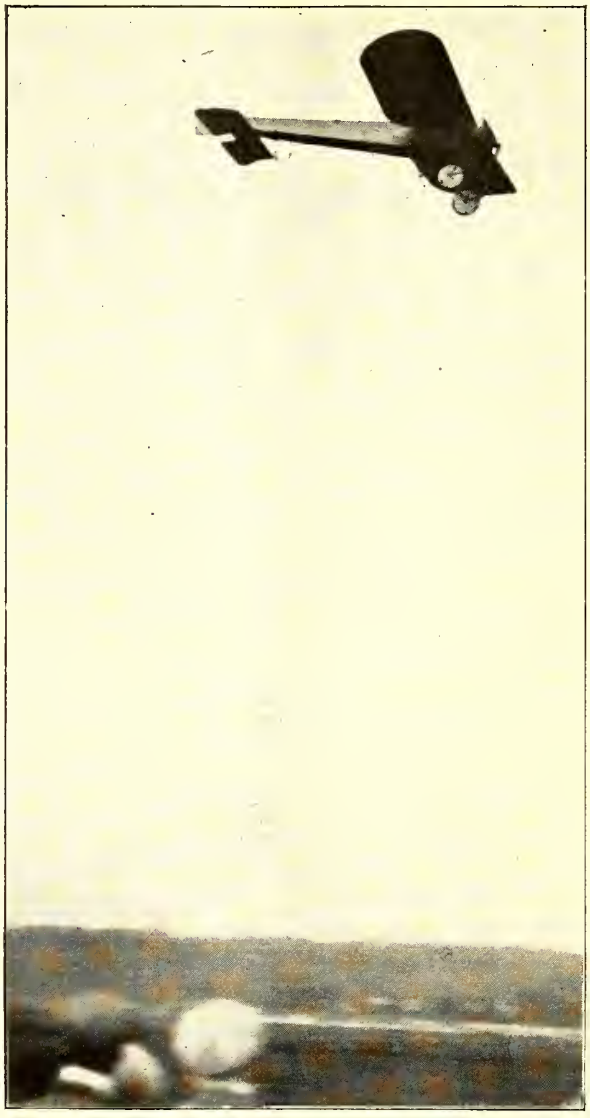
The Plain (Bristol School).—Bad wind in morning. In afternoon Mr. Pizey out with Mr. Featherstone for tuition in gusty wind, Lieut. Ercole three solos in fine style, and Mr. Lister good flight, landing well. Other solos by Lieut. Pickles and Mr. Prendergast. Mr. Bendall up with Mr. Lister for tuition, Mr. Gordon England with Dr. Cordner. Mr. Pizey alone on one of two-seaters, afterwards taking Mr. Bendall for a trip in the same machine with spare wheel to Colonel Smeaton, who had burst tyre near Fargo, and wheel being fitted, both machines were flown back to sheds. Mr. Smith-Barry and Lieut. Fielding out on biplane No. 55. Colonel Smeaton made straight flight to Fargo, then rolling practice on one of the school monoplanes, one of wheels bursting, which was replaced by Mr. Pizey.

Windermere.—Lakes Flying Co. biplane out for short flight, but air very bumpy.

Thursday, June 6th.

Brooklands.—At Sopwith School, early, Messrs. Alston, Herbert, and Webb-Bowen receiving instruction with Mr. Raynham. Evening. Mr. Raynham out solus in wind; later, wind having dropped, with Messrs. Webb-Bowen, Powell and Howell.

At Bristol School, at 5 a.m., Mr. Hotchkiss out with Capt. Agnew. Capt. Becke solus, doing two figures of eight. Mr. Hotchkiss up again with Capt. Agnew. Mr. Bettington taxiing on Anzani monoplane for 10 mins. Mr. Hotchkiss up again with Mr. Holyoake, and later up again as passenger behind Mr Holyoake, teaching rudder control.



Mr. W. B. R. Moorhouse, who finished third, and may have won second prize, in the Aerial Derby, flying his R. and M. monoplane.

At 6.30 p.m., Mr. Busteed solus on biplane, doing two circuits. At 7.15, Mr. Hotchkiss up with Lieut. Anderson, then with Mr. Holyoake, afterwards flying as passenger with latter. Mr. Hotchkiss then up with Capt. Agnew and again with Lieut. Anderson and again with Capt. Agnew. Mr. Busteed out doing two circuits on two-seater monoplane. Mr. Bettington doing hops on Anzani monoplane.

Hendon.—Pupils out at 5 a.m., working till 6.30, when wind got up. Messrs. Scully, Fuller, Salmond, Rathborne, Wynne, and Hoelscher doing straights with instructor, and Major Liles solo straights, on Farman, while Baroness Schenck doing straights, and Messrs. Morris and Roupell circuits on Howard Wright. In evening, Capts. Nicolas and Salmond, and Messrs. Rathborne, Scully, Wynne, Kershaw and Hoelscher doing straights with instructor on school 'bus, weather being too gusty for solo flights; Messrs. Grahame-White and Turner passenger carrying.

At Blériot School, new 50-h.p. Blériot, which Mr. R. B. Slack is going to use in International Correspondence School "Circuit of Britain," arrived, and being of very latest type, came in for much admiration.

The Plain (Royal Flying Corps).—Capt. Loraine first out on

F.8. making four successive trips of 15 mins.' duration, taking up Capt. Collins, Lieut. Body and Lieut. Walker, after this taking Staff-Sergt. Unwin, as passengers. These were exceptionally good flights. Staff-Sergt. Brockbank doing very good rolling practice on *F.8.* being followed by Staff-Sergt. Unwin. Later Staff-Sergt. Brockbank, in repeating rolling practice, had nasty accident. The machine was rising, and in trying to bring it level, he dipped very suddenly, causing whole machine to come to earth, smashing everything excepting one wing, elevator and tail. Fortunately he was not seriously hurt, having badly sprained arm, although being thrown from his seat and over the elevator. His boots and clothes were all torn by wires.

The Plain (Bristol School).—Lieut. Ercole out for certificate, and passed satisfactorily, observers being Colonel Smeaton, Capt. Allen, and Lieut. Fielding. Mr. Pizey up on one of two-seaters, first with Mr. Bendall and then with Mr. Smith-Barry, Mr. Bendall flying with Mr. Lister and Dr. Cordner on one of school biplanes. Major Boyd Moss made really good solos, landing well each time. Lieut. Pickles and Mr. Lister solos, landing very well. Lieut. Fielding giving instruction to Mr. Featherstone, Mr. Smith-Barry on biplane No. 55. Mr. Gordon England testing modified tractor biplane just received from the works at Filton, and found machine splendid flyer, rising to a good height in very short time and landing very gently.

Mr. Pizey first out in evening, taking Mr. Featherstone for tuition, Mr. Bendall afterwards, taking same pupil twice. Mr. Gordon England, Mr. Smith-Barry, and Lieut. Fielding all out, latter giving tuition to Mr. Featherstone. Lieut. Pickles two fine solos, about 800 ft. Major Boyd Moss was for two good flights, and Colonel Smeaton circuits. Mr. Pizey with Lieut. Fielding as passenger, made very clever flight on one of military two-seater monoplanes, flying for over half an hour at 1,300 ft. Later Mr. Pizey on same machine with Colonel Smeaton, Mr. Gordon England made good flights on modified tractor, in first up for half-hour and afterwards with passenger about 20 minutes.

Windermere.—Lakes Flying Co. biplane out in morning carrying passengers. In afternoon Admiralty Deperdussin arrived to be fitted with floats.

Friday, June 7th.

Brooklands.—At Deperdussin School, early, Capt. Brooke-Popham and Mr. Bellairs on taxi, and Lieut. Porte, R.N., testing two-seater. In evening, Capt. Dawes on brevêt machine.

At Sopwith School, early, Mr. Raynham out in thick fog with Mr. Hedley; later, fog having cleared, with Messrs. Alston, Herbert, Webb-Bowen, Howell and Powell. In evening, Mr. Raynham out solus, followed by Mr. Hedley. Then Mr. Powell with Mr. Raynham. Mr. Sopwith's Blériot now fitted with covered-in fuselage, recovered planes and tail, out for test flight. Covering in of fuselage has apparently increased speed considerably, but Mr. Sopwith says much more rudder is needed in turning corners, and it is necessary to warp inwards..

At Vickers School, evening, Capt. Darbyshire and Mr. Knight on Vickers No. 2 for straight flights.

At Bristol School, 6 a.m., Mr. Hotchkiss up with Lieut. Anderson. Lieut. Bulkely then doing straights on same machine. Mr. Hotchkiss up with Lieut. Anderson again, then with Lieut. Wilmer. Capt. Becke flew solus for three circuits at about 200 ft. Mr. Hotchkiss up with Capt. Agnew, then again behind Mr. Holyoake, who is progressing favourably.

At 7 p.m., Capt. Becke started for brevêt, which he flew for at about 200 ft., doing each five figures of eight in about same time of 20 mins., second landing being right on the observer's mark. Mr. Busteed then took up Mr. Holyoake and later Capt. Agnew. Mr. Kemp went for solo on biplane then took up Lieut. Wilmer. Lieut. Bulkely flew four straights solus. Mr. Hotchkiss took Capt. Reid for first passenger trip. Mr. Lane flying straights on monoplane and Mr. Bettington rolling and doing some hops on same machine.

Eastchurch.—At 4.30 a.m., Capt. Gordon out on school biplane. On returning to aerodrome he picked up Lieut. Courtney as passenger and flew to Deal, where, in landing on the golf course, he had the misfortune to break a skid, and slightly damage the lower plane. This was, however, repaired, and the return journey was resumed next day. He landed at Whitstable on the way home on account of a threatening thunderstorm. This, fortunately, blew over, and with a quarter of an hour's flight was safely home.

Lieut. Spencer Grey, with Leading Seaman Russell as passenger, started at 4.45 a.m. for Hendon. Having had a somewhat unsatisfactory journey, and after landing near Tilbury and Barking, on account of fog, he finally landed at Rainham, Essex, narrowly missing a tree in the descent, owing to gusty wind. He ended with an unlucky "nose dive" which somewhat damaged the engine and undercarriage. Lieut. Grey was cut slightly by striking the wires as he was thrown forward, and rather badly shaken. Russell managed to evade even so much.

Mr. Alec Ogilvie out at 5 a.m. on N.E.C. Wright with Mr. Fowler as passenger, putting in about a 50 mins'. flight.

Farnborough.—Lieut. Parke, R.N., started for hour's test flight on military Avro, ran into a patch of fog, and in trying to get out lost his way. Dodged trees and houses for ten minutes, tried to alight several times, but had to jump hedges, and finally landed amid long grass. Mr. De Havilland, in search of him on B.E.2, also nearly lost his way. When fog lifted, Mr. Parke got out under own power in spite of long grass, but on way back to Factory suffered severely from rain.

Filey.—Mr. Brereton out in afternoon testing new machine specially prepared for exhibition flights during coming season. He made several flights in Bay during afternoon, flying well out to sea at good altitude.

Hendon.—At Grahame-White School, school machine laid up owing to inlet valve trouble on engine, so school work confined to the pleasant task of brevêt getting on Howard Wright, Messrs. Morris and Roupell getting through easily, in spite of 10-mile wind. In evening, Mr. Grahame-White and Mr. Lewis Turner out on new Farman machine for tests and adjustments; Capts. Salmond and Nicolas Lieut. Rathbone, and Messrs. Hoelscher, Wynne and Fuller doing straights with instructor, and Mr. Kershaw solo straights.

At Blériot School, raining off and on nearly all day until evening, when Mr. Hall managed to put in straights, and M. Pierre Gandillon (new pupil) had first rolling practice, and did remarkably well across ground and back, showing himself very quick at keeping machine on straight course. In evening, Mr. Crawshay out on 50-h.p. cross-country Blériot for about 20 mins., flying, as usual, very well indeed.

The Plain (Bristol School).—Mr. Pizey tuition to Mr. Featherstone, then for solo on school monoplane, afterwards taking Dr. Cordner circuits. Capt. Allen was up about half-hour and landed well. Good solos on Biplane No. 66A by Major Boyd Moss (three trips), Mr. Prendergast (two), Mr. Lister (two), all showing remarkable progress. Colonel Smeaton made four very good flights on one of monoplanes. Mr. Gordon England up on tractor biplane for about 15 minutes, afterwards taking up Mr. H. C. Lane-Fox, M.P. for West Riding of Yorkshire, and flying for wide circuit, passenger expressing himself highly pleased with the experience. Mr. Lane-Fox was also taken for trip on one of the school biplanes by Mr. Gordon England.

Saturday, June 8th.

Brooklands.—At Sopwith School, Mr. Sopwith on Blériot and Mr. Raynham on Burgess-Wright to Hendon for meeting. Later in evening Mr. Raynham, victorious at Hendon, returned and went on with school work as usual.

At Deperdussin School, Lieut. Gill out on brevêt machine, and Lieut. Porte, R.N., started for Hendon, came back for attention to engine, and started again, arriving in excellent style.

At Vickers School, *Vickers II* out with Capt. Darbyshire and Mr. Knight doing straights.

At Bristol School, 6.30 p.m., Mr. Hotchkiss first out with Lieut. Anderson, giving him three circuits with control of machine from passenger seat. Then up again with Capt. Agnew for three circuits. Mr. Kemp then up with Lieut. Wilmer for three circuits. Then up again with Capt. Reid. Mr. Hotchkiss then took Lieut. Hope (new pupil) for first trip. Lieut. Bulkely then up solos for three circuits, making two landings. Mr. Kemp then took Lieut. Anderson and afterwards Lieut. Wilmer. Mr. Hotchkiss then put Lieut. Anderson in pilot's seat and got up behind and flew with him for four straights. Later he went behind Capt. Agnew for four straights to teach him foot control, which he managed excellently. Mr. Hotchkiss then up for one circuit solus, finishing with a spiral glide to shed door.

Barnstaple.—M. Salmet left Barnstaple and flew to Westward Ho! where he gave an exhibition of flying, and in the evening flew to Bideford.

Eastchurch.—Mr. McClean out on 70-h.p. tractor carrying several passengers during day, including Captain Bidder, Mrs. Bidder, Miss G. Brown, and Captain W. S. Stafford, taking each in turn for a trip round the island, attaining a height of about 500 ft.

Mr. Jezzi out with his tractor biplane making several circuits of ground. We are hoping to see this machine shortly put through a small duration test.

Capt. Gordon arrived back in the afternoon from Deal on school biplane.

Capt. Carden, R.E., accomplished a most meritorious performance on Dunne biplane when qualifying for his brevêt, and then landed within two yards of mark. This machine has certainly not been seen before to such advantage. Capt. Carden was, however, prevented from competing the second half of the test owing to the breaking of a water pipe on the engine.

Hendon.—At Grahame-White School, rain in morning stopped school work, only flights being some straights by Mr. Kershaw. In afternoon no school work owing to "Circuit of London," reported elsewhere.

At Blériot School, after departure of competitors in "Aerial Derby" in afternoon, Mr. Weir had 50-h.p. Blériot out and did very good flight in 12-15 m.p.h. breeze.

The Plain (Royal Flying Corps).—In evening, Capt. Loraine out on Deperdussin for solos for 30 mins., reaching about 1,000 ft., and out again ¾ hour. This flight he gave splendid display of banking and turning, landing with a splendid spiral. His third flight he took up Lieut. Porter as passenger, but owing to engine trouble had to return early. Later, Lieut. Porter flying *F.7.*, putting in half hour's good flying. Corpl. Ridd did good flying on *F.7.*, reaching 400 ft. Staff-Sergt. Wilson did two very good flights, fiying for half an hour.

Waterloo (Liverpool).—After fitting new crank-pin to school machine, trial was made of engine. Quite satisfactory, but flying prevented by rain.

Windermere.—Lakes Flying Co. biplane out in afternoon carrying passengers; finished with good solo flight by Mr. Stanley Adams at good height, ending with good spiral glide, but rather bumpy landing. Mr. Adams complains that water is rather difficult to see when very still.

Sunday, June 9th.

Brooklands.—Very little flying owing to bad wind. In afternoon fair crowd present when Mr. Moorhouse arrived from Hendon. He reported thick mist as far as Hounslow, where he got the usual "Hounslow bump," and had a very rough passage the rest of the way, though the air was perfeetly clear. His glide into the aerodrome from about 1,500 ft. was beautifully done, but his landing was by no means graeeful. However, it was explained by the fact that his switch had gone wrong, and he had to come down by the somewhat unhandy method of turning off the petrol.

During the afternoon Mr. Raynham and Mr. Sopwith, on the Sopwith school biplane, did some fine exhibition flying and took up a number of passengers, and as there were no competitions in progress, Mr. Hotchkiss, of the Bristol Co., was seized with the brilliant idea of interesting the crowd in the proceedings, and, incidentally, in the Bristol machine, by the process of raffling two free passenger flights. Naturally, there was a very large number of competitors, and by a curious coincidenee the two winners were Mrs. Sidney and Miss Barrow, who had come to Brooklands together. The drawing of the lots was done by Miss May Sopwith. The two lueky winners were each given a short flight of a lap and a bit, with which they were extremely delighted. Mr. Hotehkiss also took up Miss Gill, of Dublin, but owing to the switch shortening and causing the engine to miss fire, he was only able to do a half-lap. Late in the evening, when the wind had gone down, about a dozen Bristol pupils were out in turn on the biplane, and Mr. Claude Bettington evoluted on the Anzani Bristol monoplane.

Eastchurch.—11 a.m., Capt. Carden completed test for his brevêt in same convineing style as Saturday's demonstration. In afternoon, Mr. McClean out with hydro-biplane at Harty Ferry, carrying several passengers, including Capt. and Mrs. Bidder, and Mr. Alec Ogilvie, machine behaving in a highly satisfactory manner. Mr. Alec Ogilvie, with Mr. Fowler as passenger, flew over Harty Ferry to watch hydro-aeroplane tests, landing close to Swate. Mr. Ogilvie's N.E.C. engine is now started by half-turn of starting handle, which has been fitted in place of propeller starting.

Filey.—In morning early Mr. Brereton had Gnôme machine out again. He circled in bay and then struck inland, making fine circuit via Hunmanby and back to sheds. He then made another flight in rather tricky wind, doing figure eights over sea. In evening Gnôme and Isaacson machines were brought out and Mr. Brereton made very fine flights, rising on one or two occasions to great altitude. Some of his *vols planés* were exceedingly neat and his landings perfect. Although wind rather gusty machines very steady. Afterwards Mr. Brereton took several passengers up in Isaacson 'bus. Engine has just been fitted by Isaacson Co. with their latest type ball-bearing rod and shaft, and is going strong.

Hendon.—In morning, Capt. Salmond out for straights, but stopped by punctured tyre. Machine unfortunately left out and caught in thunderstorm, doing considerable damage to planes owing to severe shrinkage of fabric. A splendid afternoon and evening's flying. Messrs. Grahame-White, Verrier, Hamel, Weir, and Lewis Turner being all out doing exhibition and passenger flights.

The Plain (Bristol School).—Very little work possible, wind being very strong and trieky.

The Vienna Aero Show.

One of our leading constructors who has been visiting the Vienna Aero Show, writes that the exhibition is very disappointing on the whole, consisting of obviously experimental Austrian machines, and is only redeemed from being a fiasco by the presence of the R.E.P., Nieuport, Bréguet, Morane and Pischoff machines. He says that no figures as to weight or surface are obtainable, as there are no catalogues of any description.

The following Austrian machines are exhibited:—The Ziegler biplane, wh'ch is wood all over, including the planes, which have an anhedral angle. Behind the planes are two propellers on the same axle, turning in different directions and driven by a cardan shaft from the motor, which is in a boat-shaped body with the pilot and passenger in front of it underneath the bottom plane. It is obviously a freak, and a dangerous one at that.

The Blauen monoplane is even more of a freak, as it has an elevator and two rudders in front, and a fixed triangular cruciform tail, with the point behind. The main planes are made of loose canvas without any camber or ribs, the elevator, main planes, and tail being on one long shaft on which is fixed also a tractor screw in front between the elevator and the main plane, and a propeller between the plane and the tail. Underneath the plane is a boat-shaped body with a 50-h.p. Gnôme in front, which drives both screws in opposite directions. It is claimed that the whole machine is automatically stable, and that it weighs only 500 lbs. It has flown, but the length of flight is not known.

The Pischoff machine is of the old familiar type with the crew and motor underneath the main planes.

There is an Etrich monoplane with an 80-h.p. 4-eylinder Austro-Daimler engine, this machine being made of wood instead of steel, but otherwise there is nothing new about it, and the workmanship is bad.

A copy of a Maurice Farman machine is shown, its only difference being that all the skid struts are bowed, and the workmanship is not up to Mauriee Farman standard.

There is also a Lohner tractor biplane which has a landing carriage of the Farman type, except that the skids do not eome beyond the wheels. It is driven by a 65-h.p. Austro-Daimler, plaeed high in the fuselage, and the propeller is geared down by a chain. The workmanship is described as vile.

Of the Freneh firms, the R.E.P. people show a monoplane of the Poussin type, with a 45-h.p. engine. There is a Morane with a steel landing chassis of the type illustrated reeently in The Aeroplane, and there are two Bréguets, one with a 70-h.p. Renault, and with a 100-h.p. Chenu.

One hydro-aeroplane is shown, this being a traetor biplane of very ordinary type, and it does not seem to float well.

Next Saturday at Hendon.

Next Saturday is to be the big I.C.S. day at Hendon, when Mr. Slack, the student-pilot of the International Correspondence Schools, starts for his educational tour round England. Among the events, which will include the usual Cross-Country Handicap, with a £20 first and a £10 second prize, and a Speed Handicap round the pylons for £20, £10, and £5 prizes, is a Distance Test for International Correspondenee School students, in which the brothers James, who have been learning to fly at the W. H. Ewen School, will compete. The enterprise of the I.C.S. in buying a new Blériot for Mr. Slack's tour shows that they are very much in earnest, and it is to be hoped that the meeting will be favoured with good weather, so that the many students who will be present may see what good flying is.

A Moving Picture.

This is an age of moving things—aeroplanes, pictures (even furniture, these bad times)—and we can understand the confusion of mind of the gentleman who, on seeing Verrier aloft, described his machine as a "bioplane."

STRUT SHAPE TESTS.

Made for Mr. Alec Ogilvie, and presented by him to the Aeronautical Society of Great Britain.

The struts were tested for resistance at the National Physical Laboratory, in a four-foot wind tunnel at a wind speed of about 20 miles per hour. They were all made three feet in length and one inch thick. A brass gauge was accurately made to the required shape of each strut, and had to pass down the whole length of strut without showing serious gaps. The struts were made of silver spruce and were sand-papered to the same degree of smoothness.

From the figures supplied by the National Physical Laboratory, the total resistance in pounds on 100 feet of strut, at 40 miles per hour, has been calculated, and is tabulated in column R.

The cross-section of each strut was traced through its gauge on to squared paper, and, from the sum of small squares enclosed, the area of the cross-section, and hence the weight of 100 feet of strut in pounds (on the basis of 30lbs. weight per cubic foot for spruce) was calculated, and is tabulated in column W.

Using the same diagrams the area of each row of squares was multiplied by the square of its distance from the major axis, and the sum of these results was multiplied by a constant to give the moment of inertia of the cross-section compared to that of Strut No. 25, which was taken as standard and given a value of 1000.

These results were tabulated as column "I." The two following columns $\left(\frac{I}{R}\right.$, and $\left.\frac{I}{W}\right)$ give the relations of strength to resistance and strength to weight.

In order to determine the shape of strut which will absorb least power at 40 miles per hour, the column $\frac{I}{6R \times W}$ was tabulated, on the assumption of a gliding angle of 1 in 6.

To use the table for the determination of a suitable strut for an 80 miles per hour machine, at which speed the resistance would be quadrupled, a formula such as $\frac{I}{24R \times W}$ would be required.

To facilitate comparison the results in column $\frac{I}{6R \times W}$ have been reduced to percentages of the highest value obtained—that is for Strut No. 51.

In order to calculate the resistance at 40 miles per hour in pounds per square foot of maximum cross section of the various shapes, it will be necessary to multiply the resistance in column "R" by $\frac{12}{100}$ or .12 or for 60 miles per hour .27.

To find out the required strength for a strut the necessary moment of inertia can be calculated and a strut of simple cross-section like No. 25, of the required length, can be cut out of the timber to be used and tested to bear the required weight without too much bending.

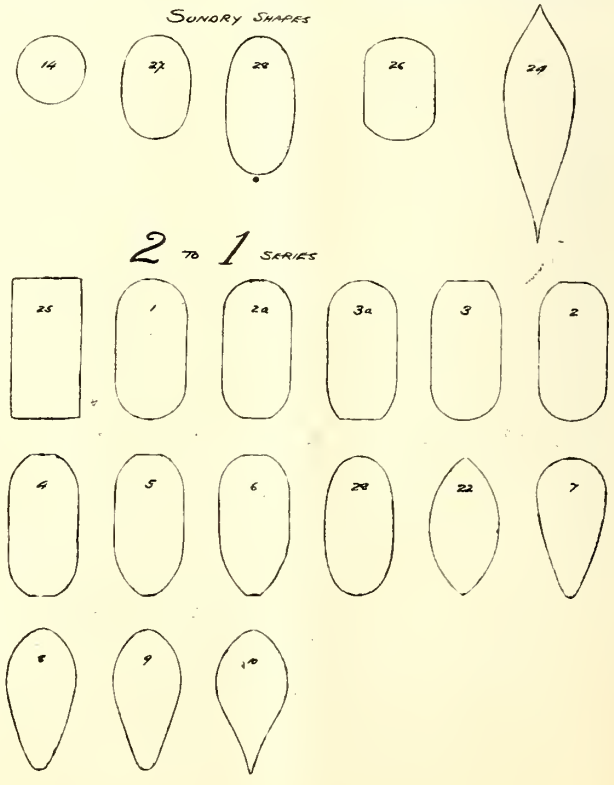
Having so obtained a required value for "I" and determined on the shape most suitable for the proposed speed and design, from the last column it is easy to increase the proportions to get the necessary strength.

From the appended example the method employed to obtain the moment of inertia and weight will be made clear.

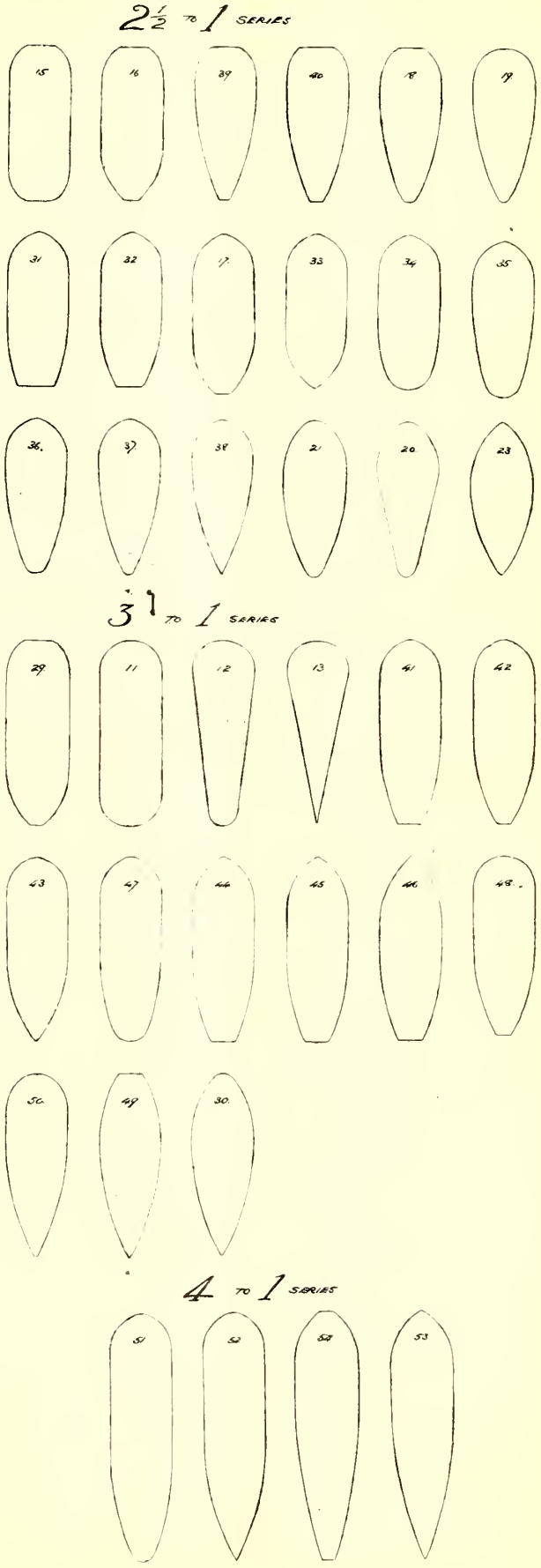
The writer desires to acknowledge the great assistance rendered by Mr. V. Le Cren in preparing this Report.

ALEC OGILVIE.

	No.	I	R	W	$\frac{I}{R}$	$\frac{I}{W}$	$\frac{I}{6R+W}$	F 40°
Circle	14	297	36.4	16.4	8.2	18.2	1.28	10
Circle at 42° ...	27	541	26.3	30.4	20.5	17.8	2.88	22
Circle at 30° ...	28	743	16.4	34.8	45.3	21.3	5.59	42
Section of Chain Tube	26	600	20.0	27.9	30.0	21.5	4.06	31
Stream-line shape According to Lanchester (Aerodynamics, p. 14).	24	690	12.3	42.5	56.1	16.2	5.95	45
Rectangle—standard for strength ...	25	1,000	46.4	41.6	21.6	24	3.12	24
English Wright Strut	1	801	14.4	37.5	55.6	21.4	6.51	49
	2a	804	14.0	37.7	57.5	21.3	6.58	50
	3a	833	13.0	38.4	64.1	21.7	7.18	54
	3	833	14.7	38.4	56.7	21.7	6.61	50
	2	804	14.0	37.7	57.5	21.3	6.58	50
American Wright Strut	4	805	12.7	37.7	63.5	21.3	7.06	54
	5	718	11.3	35.6	63.5	20.2	7.25	55
	6	681	10.6	54.6	64.2	19.7	6.95	53
	28	743	16.4	34.8	45.3	21.3	5.59	42
Farman	22	562	24.4	30.0	23.0	18.7	3.19	24
	7	485	18.6	29.3	26.1	16.5	3.46	26
	8	464	23.3	29.0	19.9	16.0	2.74	21
	9	434	23.0	28.1	18.9	15.4	2.61	20
	10	400	23.3	25.6	17.2	15.6	2.40	18



	No.	I	R	W	$\frac{I}{R}$	$\frac{I}{W}$	$\frac{I}{R+W}$	F 40
	15	1,110	16.4	49.2	67.6.	22.6	7.55	57
	16	957	11.3	45.2	84.6	21.2	8.46	64
	39	716	5.7	39.7	125.5	18.0	9.7	73
	40	765	5.7	41.0	134.0	18.7	10.2	77
	18	726	6.3	40.0	115.0	18.2	9.31	71
	19	683	6.7	38.6	102.0	17.7	8.65	66
	31	953	7.3	45.6	130.0	20.9	10.6	80
	32	899	7.0	44.4	128.3	20.2	10.4	79
	17	965	10.3	46.3	93.7	20.8	8.94	68
	33	905	9.3	43.5	97.5	20.8	9.11	69
	34	950	8.3	45.2	114.2	21.0	10.0	76
	35	794	7.3	42.1	108.7	18.8	9.25	70
	36	716	6.0	39.7	119.2	18.0	9.43	72
	37	669	6.0	38.0	111.5	17.6	9.04	68
	38	639	13.3	36.4	48.1	17.5	5.5	42
	21	802	12.3	40.1	65.2	20.0	7.03	53
	20	519	19.4	38.8	26.8	13.4	3.35	25
Blériot	23	638	20.4	36.6	31.3	17.4	4.01	30
	29	1,240	11.4	57.3	109.0	21.6	9.92	75
	11	1,315	17.0	58.5	17.4	22.5	8.22	62
Semicircular head	12	721	17.0	45.8	42.5	15.7	4.88	37
	13	445	28.0	33.4	15.9	13.3	2.21	17
	41	1,079	6.3	53.4	171.0	20.2	11.85	90
	42	1,041	6.7	52.0	155.0	20.0	11.34	86
	43	1,001	7.3	50.0	137.1	20.0	10.65	81
	47	1,064	7.3	52.9	146.0	20.2	10.96	83
	44	1,055	6.7	52.8	157.5	20.0	11.35	86
	45	1,028	6.3	51.9	163.0	19.8	11.43	87
	46	953	8.7	49.8	110.0	19.1	9.35	71
	48	1,012	7.3	50.6	139	20.0	10.65	81
	50	877	6.0	47.0	146	18.6	10.55	80
	49	764	7.6	44.8	100.0	17.0	7.57	57
	30	768	8.3	44.1	92.5	17.4	8.17	62
	51	1,468	6.7	71.0	219	20.6	13.2	100
	52	1,364	7.3	67.2	187	20.3	12.3	93
	54	125.3	6	66.1	209	19.0	12.3	93
	53	1,167	6	62.0	195	18.7	11.9	90



The New Minister for War.

As The Aeroplane goes to press it is made known that Colonel Seely will take Lord Haldane's place as Secretary of State for War. This will be the best of good news for all of us who are concerned for the welfare of our aerial defences. Colonel Seely has done more to help the cause of aviation than most people know, and it is not saying too much to state that at one time he practically staked his position on the placing of our aerial defences on a proper footing. He is young, full of energy, and really enthusiastic about aeroplanes, and with his help our aerial defences will go far.

The Death of Kimmerling.

On June 9th M. Kimmerling was putting a new 80-h.p. two-seater Sommer monoplane through its trials at Mourmelon le Grand. This machine was to compete in the Circuit d'Anjou. At 5.30 p.m., accompanied by M. Tonais, an engineer, he left the ground with the intention of flying to Epernay. He made two or three circuits of the ground, rising steadily. When over the road to Bovy something happened, and the aeroplane dived straight to the ground from a height of about 400 ft., killing both pilot and passenger instantly. Their bodies were terribly mutilated. Some papers say that the cause of the accident was the breaking of a wing.

M. Kimmerling.
Photographed during the European Circuit at Hendon.

Albert Kimmerling was born in Lyons on June 22nd, 1882, and he took his aviator's certificate (No. 291) on October 19th, 1910. He took part in the raid Paris-Rome and later in the Circuit European. One of the most popular of aviators, his death will be mourned by all who knew him. Frank and courageous, the world is the poorer for his loss.

The Royal Aero Club.

The Chairman, Sir Chas. D. Rose, Bart., M.P., has received a notification from Sir W. H. P. Carrington, G.C.V.O., C.B., P.C., the Keeper of the King's Privy Purse, that his Majesty the King has been graciously pleased to become Patron of the Royal Aero Club.

At the meeting of the Committee on the 4th inst., the Chairman, before proceeding with the business of the meeting, referred to the deplorable loss to the science of aviation sustained by the death of Mr. Wilbur Wright. On behalf of the members of the club Lord Montagu, a member of the Club's Council, sent a wreath to the funeral from New York.

The following new members were elected:—Major P. N. Buckley, Andre Marcel Desoutter, William Hugh Ewen, Samuel Jordan Gillchrest, Robert Leicester Harmsworth, M.P., Richard Heyne, O. F. Odell, Andrew Mitchell Ramsay, Sir John C. E. Shelley, Bart., and Frederick Hornsby Wright. Total membership to date, 1,375.

The following aviators' certificates were granted:—218, Henry Charles Biard (Howard Wright biplane, Hendon); 219, Hugh Percy Nesham (Bristol biplane, Brooklands); 220, Charles Lindsay Campbell (Bristol biplane, Salisbury); 221, Francis Henry Fowler (Howard Wright biplane, Hendon); 222, Thomas O'Brien Hubbard (Howard Wright biplane, Hendon); 223, Montagu Righton Nevill Jennings (Bristol biplane, Salisbury); 224, Alphonse Pothet (French subject: subject to sanction of Aero Club de France) (Blériot monoplane, Hendon); 225, Richard T. Gates (Howard Wright biplane, Hendon); 226, Lieut. David Percival, R.G.A. (Bristol biplane, Salisbury); 227, 2nd-Corpl. Frank Ridd, R.E. (Bristol biplane, Salisbury); 228, Lieut. Leonard Dawes (Bristol biplane, Salisbury); 229, Lieut. J. N. Fletcher, R.E. (Cody biplane, Laffans Plain); 230, Lieut. Baron Trevenen James, R.E. (Howard Wright biplane, Hendon); 231, Marcus Dyce Manton (Howard Wright biplane, Hendon).

Public Safety and Accidents Investigation Committee.

It was decided to appoint club representatives at the various centres to inquire into and report on all accidents.

The following have so far been appointed:—

Eastchurch—Mr. F. K. McClean, Mr. Alec Ogilvie, and Com. C. R. Samson, R.N.

Salisbury—Mr. G. B. Cockburn, Capt. J. D. B. Fulton, R.F.A., and Capt. E. L. Gerrard, R.M.L.I.

Brooklands—Mr. W. O. Manning and Mr. R. L. Charteris.

Hendon—Mr. C. Grahame-White, Mr. H. Barber, and Mr. R. T. Gates.

Manchester—Mr. P. B. Murray, Mr. J. B. Butler, and Mr. E. A. Pochin.

Freshfield—Mr. G. Higginbotham.

Report on Mr. Fisher's Accident.

Report on the fatal accident to Mr. E. V. B. Fisher and his passenger, Mr. Victor Mason, when flying at Brooklands on Monday, May 13th, 1912, at about 6 p.m.

The Special Committee sat on the following dates:—Tuesday, May 21st, Wednesday, May 22nd, and Tuesday, May 28th, 1912, and heard the evidence of two eye-witnesses, both of whom were aviators holding certificates. The Committee also heard the evidence of the designer and manufacturer of the aircraft, and of the representative of the maker of the motor. The written reports of other witnesses, and the report of Dr. Eric Gardner, were also considered.

From the consideration of this evidence the Committee is of opinion that the following facts are clearly established:—

(1) That the accident originated while the aircraft was making a left-hand turn at about 100 ft. from the ground. (Evidence as to height, in the opinion of the Committee, is not conclusive.) (2) That the aircraft had turned through an angle of about 90 degrees in the horizontal plane. (3) That it then side-slipped inwards. (4) That it struck the ground head first, with the tail practically vertical. (5) That from the effect produced on the engine and other parts the velocity at the moment of striking the ground was very considerable. (6) That the fire which took place originated subsequently to the fall, and was the result not the cause of the accident. (7) That there is no reason to suppose that the structural failure of any part of the aircraft was the cause of the accident. (8) That from the commencement of the flight the aircraft was flying tail down. (9) That the engine was actually running when the aircraft struck the ground. (10) That Mr. Fisher was not in any way incapacitated so far as the normal control of the aircraft was concerned by an injury to his left shoulder, which he had sustained on April 18th, 1912. (11) That the passenger did not cause the accident. (12) That Mr. Fisher was thrown, fell, or jumped out of the aircraft when the latter was a considerable height from the ground, his body being found about 60 ft. in front of the spot where the aircraft struck. The passenger remained in the aircraft: his position was such that he could not readily have been thrown out. (13) Mr. Fisher was granted his Aviator's Certificate No. 77, on May 2nd, 1911, by the Royal Aero Club.

Opinion.—The Committee is of opinion that the cause of the accident was the aviator himself, who failed sufficiently to appreciate the dangerous conditions under which he was making the turn, when the aircraft was flying tail down, and in addition was not flying in a proper manner. A side-slip occurred, and Mr. Fisher lost control of the aircraft. It seems probable that his losing control was caused by his being thrown forward on to the elevating gear, thereby moving this forward involuntarily, which would have had the effect of still further turning the aircraft down. This would explain his being thrown out whilst in the air. In the opinion of the Committee it is possible that if the aviator had been suitably strapped into his seat he might have retained control of the aircraft.

Competition Rules.

Competition Rules.—(Regulations for preventing collisions in the air. Flying grounds.) Rule 11, paragraph (*e*), was again considered, and it was resolved to recommend that the rule be altered as follows:—(*e*) Any aircraft overtaking another aircraft is responsible for keeping clear, and in no case must turn in across the bows of the other aircraft after passing it so as to foul it or risk a collision, and must in addition, subject to rule 12, conform to the following regulations:—(1) If flying on the same level, *i.e.*, within 5 metres above or below, must pass outside the overtaken aircraft at not less than 10 metres. (2) If on a different level, must not pass nearer than 10 metres. The distance shall be taken between the nearest adjacent points of the respective aircraft. An aircraft when being overtaken shall not alter its course or level, save when in the act of overtaking and passing another aircraft. 12. Any competitor driving so as to influence another driver's aircraft in a dangerous manner shall be considered to have committed an offence.

The Hanriot Patents.

It is interesting to note that Hanriot (England), Ltd., the new firm which has recently been started, with M. Maurice Ducrocq as general manager, has acquired not only the right to manufacture Hanriot machines in England, but the patents of which the French company are the owners. These patents will be used in the construction of the British Hanriots, and it may be well to note that one of them concerns the general arrangement of the landing chassis.

Correspondence.

The Editor of The Aeroplane *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* The Aeroplane, 166, *Piccadilly, W.*

Box-Kites and Biplanes.

Sir,—In the Editorial of the number of The Aeroplane issued on April 11th, you compared the merits of the tractor biplane and the type which you term the box-kite.

I suppose that when speaking of the box-kite you have in mind that unscientific and unpractical death-trap known as the "F" type of biplane. Now, though I would be the last person to uphold the merits of such a contraption, nevertheless, I cannot let your Editorial pass without a comment, because there are other machines which come under this category, to which your comparisons are very unfair.

I take it that a box-kite machine has, like a box-kite, its planes held together by means of outriggers.

If this definition is assumed, the Cody, the Curtiss, the Sanders, and many tractor biplanes, such as the Savary and the Wright, are box-kites. If I am not mistaken, Mr. Cody's machine could give points to any of the fuselage-type tractor biplanes and to many monoplanes also, on the score of speed. It is also far superior to all tractor biplanes as regards stability and safety, both in air and when landing and alighting.

[No it is not. It is merely faster and stronger than most.—Ed.]

Surely you do not maintain that Mr. Cody, or any pilot of the front-elevator type of Curtiss biplane, must be very ignorant because they make cross-country flights on their machines?

Then, again, you argue that the tractor biplane is the better because of the better protection which it affords to the pilot. But any box-kite machine can be fitted with an equally protective "body," and several of them are, such as the Howard Wright and the Grahame-White "Baby."

"Loaded Front Elevator."

[This correspondent is entirely the victim of a misunderstanding. The term "box-kite" is no attempt at definition of a type: it is just a piece of happy invective which has somehow come into general use, and it is only used to designate a machine with all the following characteristics:—

(1) Lifting tail.
(2) Depressing front elevator.
(3) Pilot on or in front of leading edge of lower plane.
(4) Engine immediately behind him.

No tractor machine can come into the category, nor can machines such as the Cody, etc., which have lifting elevators, and are therefore more or less stable fore and aft.

Mr. "L. F. E." has evidently fallen into the very error which was to be expected from the use of the confusing term "fuselage biplane" instead of "tractor biplane" for the really safe type, for the use of an enclosed fuselage instead of an outrigger is, though very important, nothing like such a radical point as the distinction between "tractor" and "box-kite" types.—P. K. T.]

Insurance of Aviators.

Sir,—Judging from various circulars that are floating around, the insurance folk are beginning to think of insuring us aviators. Now all I have received seem to emanate from people who think that everybody who flies owns a machine. As you know, the great majority do not, being pupils, instructors, stunt performers to firms, and Army and Navy pilots, of which latter class I form a small and microscopic proportion.

Now take my own case. I don't care one blow if I do "do in" my 'bus, it is up to Government to repair it; but it is totally different if I "do" myself in. My ordinary insurance company rule out aviation accidents, and Government only give us compensation if permanently disabled. Surely the insurance companies could tackle this small risk.

Take the number of pupils learning. Take the Bristol Co., who have trained the majority of pupils. They have, I know, not killed a single pupil, and I don't think seriously damaged one either. Another firm advertise with truth that they have never even damaged a single machine. Here, again, is a large army of prospective premium-payers which the insurance companies, for some reason or other, are scarey of touching.

What is wanted, in short, is a purely personal risk form of insurance for damage to self, and as most of us are bachelors, the payment in case of death might be ruled out. It would not, of course, be considered quite playing the game for an insurance agent to finish off a damaged aviator with a spanner so as to avoid paying compensation.

So just you stir up insurance folk, and oblige,

"An 'Umble Admirer."

The Gradual Awakening.

Sir,—Since writing the letter published in The Aeroplane recently I have been fortunate enough to see some excellent flying at Bath arranged by the Grahame-White Aviation Company in connection with the Bath and West of England Show. When I arrived at 6.45 p.m. Mr. B. C. Hucks, who had been flying in spite of the bad weather conditions earlier in the day, was flying circuits for the benefit of the crowd, which, judging by the attendance at the show, must have numbered about six thousand. When he landed at 7.10 p.m. he was received with the wildest enthusiasm and carried shoulder-high, regardless of the guardians of the peace, and induced to autograph postcards for all and sundry.

This certainly does not hear out your remark that the public are not interested in provincial meetings.

What the public is *not* interested in is standing behind a rope to see aviators casually playing "pitch and toss" and dilatory mechanics strolling about with hammers and oilcans until such time as the wind makes prolonged flying impossible. This is what constitutes fifty-five out of sixty minutes of a "provincial aviation meeting."

All praise to the missionaries who are now making aviation a sound and business-like proposition.

By the way, the public seem to be still rather in the dark as to the different types of machines. I overheard two ladies discussing Grahame-White's Blériot at the Bath meeting:

First Lady: "This is quite different to the machine we saw the other day" (Salmet's Blériot).

Second Lady (in a superior tone of voice): "Oh, yes! The other was a monoplane"!

R. V. Tivy.

[It is comforting to hear that interest in increasing, but it is doubtful whether, if the wind had prevented the aviators at Bath from flying, the crowd would have been any more reasonable than hitherto. Nothing succeeds like success.—Ed.]

The Totally Enclosed "Avro."

Sir,—In a recent Aeroplane there is a short account of the "Avro" monoplane. Since its arrival at the track this machine has spent some considerable time in the air, and so the system of cellon windows has been thoroughly tested.

At first one would think the view would be limited, but such is not the case, as the pilot can look through the windows on both sides, and, in fact, the view in this respect is the same as any ordinary monoplane. In addition there are windows in the sides of the body under the plane, so that the view is actually *better* than most other machines.

The longest flight was of 20 minutes' duration, at the conclusion of which the pilot had no difficulty in gliding from 1,000 ft. and landing satisfactorily. We ourselves are so satisfied with it, we intend carrying out the idea in future biplanes. Of course we know there is a prejudice against this system, but we hope to live down this prejudice as has been our privilege with practically all our previous work.

In the case of the unavoidable "discontinuation" of some weeks ago, when the machine was completely reversed, the *cabane*, which is built especially strong, held the machine up so that the pilot was easily able to make his escape through the normal entrance in less than ten seconds.—A. V. Roe and Co.

(Per) H. V. Roe.

Over-sea Flying.

Sir,—*Re* your article under the heading, "A First-class Return," on May 30th, it gives one a certain amount of relief to find at least one aeronautical journal is not afraid to hold the *Daily Mail* to the truth as regards its aeronautical occasional paragraphs, and to point out to its readers the true state of our position in aeronautics when we are being compared with foreign countries.

As to M. Crombez's great over-sea flight on May 21st, as The Aeroplane points out, it is no more than what many many British aviators have done previously. The *Daily Mail*, at the time the flights were made, I believe, did refer to these flights, but, of course, these aviators were British.

Perhaps one could be pardoned for mentioning an over-sea flight that took place two years and two months ago, namely, 51½ miles over the Mediterranean Sea from Nice Aerodrome, accomplished by the late the Hon. C. S. Rolls, but it was such a long time ago, and the aviator was merely British!

A. G. Leeper.

Launching Aeroplanes.

Sir,—Is the following an altogether impracticable suggestion for overcoming the difficulties in bringing a naval scout aeroplane into and out of action?

The aeroplane, which might dispense with a landing chassis, is carried on a destroyer or other vessel capable of a speed equal to its flying speed, say 30 miles an hour. To launch the aeroplane the destroyer steams at 30 m.p.h. (or less against a wind), the aeroplane lying on a slightly raised structure on deck aft, secured only by a steel hawser or other line, attached so that the machine will float as a kite when towed at its lifting speed.

The pilot takes his place in the machine, and as soon as it is allowed to lift the line is slowly paid out. When clear, the pilot starts his engine (some form of self-starting device, or clutch, is, of course, necessary), and as soon as the aeroplane become self-supporting the line is cast off *at the deck end*.

On returning, the pilot steers directly over the boat, and when both boat and aeroplane are travelling at the same speed he brings the latter down until the line can be secured on deck, when by a slight increase in the speed of the boat the aeroplane can be converted again into a kite. The pilot simultaneously stops his propeller and is drawn down to deck.

I do not claim to have given this suggestion much thought, nor to have expressed it in a particularly intelligible way. The first difficulty which presents itself is the line, which might swing about during flight and perhaps upset balance. This might perhaps be overcome by drawing it up into the machine and dropping it again when descending. Furthermore, the line would float out behind considerably and would therefore need to be long enough to be secured on deck at the completion of the flight without the pilot having to fly too low; it might, however, be secured, on the return, in the bows, the boat *overtaking* the aeroplane, and thus be kept clear of masts, funnels, etc., and brought to the stern by hand.

I am afraid there may be other and more insurmountable objections, but I offer the suggestion for what it is worth.

Woking. Owen B. Howell.

Flying at Hendon.

Sir,—*Re* your remarks about "A Carping Critic" and the letter of complaint sent by "C. S.," I cannot help remarking that "general intelligence" is, apparently, a subject that was not taught at the school where "C. S." was educated. I was present at the Whit-Monday meeting, and was remarkably pleased and satisfied with the racing and other flights. The aviators undoubtedly did their utmost to interest the crowd, in spite of the 20-mile wind, and I am surprised to hear that "C. S." was so disappointed. The suggestion that "C. S." should ascend on a windy day is very good, and if "C. S." does not like venturing I would be pleased to take his place and let him know what it feels like.

Richmond. Jeremiah Jenkins.

Sir,—As a constant visitor to the Hendon Aerodrome, may I take the liberty of endorsing the remarks in this week's Aeroplane on the opinion of "C S." in regard to the flying on Whit-Monday?

If, as "C. S." says, he is a frequent visitor at the Aerodrome and is so interested in aviation, it is, surely, time that he knew enough about weather conditions to know that an aviator appreciates a steady wind much more than he does gusts, and that, taking everything into consideration, Whit-Monday's performance was most excellent.

It seems a pity that people cannot be brought to regard aviation as more of a science and less of a mere exhibition for their amusement.

Brondesbury. Sidney Melville.

Pylon Racing

Sir,—In your article on the danger of pylon racing, etc., in to-day's Aeroplane you ask if any reader has an idea to give. I do not presume that my suggestion is at all practicable.

In the pylon racing I have seen at Hendon, etc., it has often struck me that certain marks are more dangerous than others. My idea is that these turnings should be made less sharp by placing, say, three pylons, making it necessary for the machine to take a sharp corner at a safe-size arc. Perhaps this would prevent dangerous banking.

Maida Vale. C. H. P.

[A good idea, but it would not prevent shaving the pylons at the risk of touching a wing against one and turning over.—Ed.]

Sir,—I am glad to read your excellent leader on Aerodrome Competitions, and, as you ask for comment, I am sending you these few lines. Everyone will rejoice if something can be done to reduce the risks in these competitions, both for the aviators' sakes and for the future of aviation, which, like all other sports and businesses, depends mainly on the favour of the public for its advancement and prosperity.

I think it is generally conceded that pylon flying is the most dangerous form of aeroplane flying, and I also believe that it is not the most popular form of competition. If so, if would appear to be advisable to find something to take its place that is less dangerous and more popular. Your leader refers to the dangers attached to various sports, but may I point out that efforts have been successfully made from time to time to make rules that reduce the wastage of life?—such as doing away with the open ditch in steeplechasing, and stopping the charge at polo. I believe that short cross-country races, instead of pylon flying, will make for greater safety without reducing the interest in aviation meetings. As a basis for argument I beg to suggest the following idea for a race:—

Competitors shall, immediately after starting, make a two-mile point and return over the starting line of the aerodrome at a height of not less than 500 ft. (making a gradual rise). Twice round a course of 10 miles' length, passing over the aerodrome each circuit, and finishing at a height of 500 ft. No aeroplane is to fly at a less height than 500 ft. at any period of the race. The finishing line to be at least a quarter of a mile long. Mark Kerr (Captain, R.N.)

Sir,—May I put forward a suggestion *re* cross-country flying? I do not think that anyone can find fault with the writer's suggestion of making the competitors fly a few laps before leaving the aerodrome. Before flying the specified number of laps the officials should put the competitors on their honour not to circle the pylons or in any way to endanger the crowd by low flying, and to leave the aerodrome at a height of eight or nine hundred feet. If any competitor flew to the danger of the crowd or circled the pylons or did not leave the aerodrome at the specified height he would be disqualified.

As well as making the competitions void of accident, it would give the competitors a chance of seeing whether their engines were in good order. If there was anything amiss with it he could come down to adjust it while he yet had the chance before leaving the aerodrome. It would certainly delay him in his start, but it would certainly avoid, perhaps, having to come down in a field not suited to receive aeroplanes, and, perhaps, from turning over in landing on the field. I hope that this will find favour. A. V. H.

The All-Foreign Advertisement Tour.

Sir,—Apropos of the "All-Foreign Advertisement Tour," one very funny thing about this was the way the itinerary was announced. I do not know whether you noticed at the time that it was prefaced by the somewhat astonishing statement that "in the country the chances of seeing men fly have been few and far between. But for the two *Daily Mail* £10,000 prizes *there would probably have been no chances at all.* (Italics mine.) In the West of England especially few people have even looked at an aeroplane, even on the ground. It is with the West of England, therefore, that the tour will begin."

Then follows a list of the places whose heathen ignorance is to be enlightened by the generosity of the *Daily Mail*, including Bristol (did any of the *D.M.* staff ever hear of such a place as Filton? Probably not.), Newport, Cardiff, Weston-super-Mare, Cheltenham, Taunton—in short, a number of the exact places where so much fine flying was done last year by a British aviator on a British machine—namely, Mr. Hucks on the Blackburn. Does not it just show how much, or how little, the people who got up the *D.M.* programme really know or care about what *has* been done?

I notice that, when the education of the West of England is completed, the "*Daily Mail* airman" (what *has* that nice little man, M. Salmet, done to have such a horrible label tacked on to him?) will probably visit the South Coast. We may therefore live in hope that the inhabitants of such benighted spots as Shoreham, Eastbourne, and Dover may at last, thanks to the munificence of the halfpenny Press, enjoy the privilege of seeing what an aeroplane is like.

M. Louise Elliott.

[Apologies to those whose letters have been crowded out.—Ed.]

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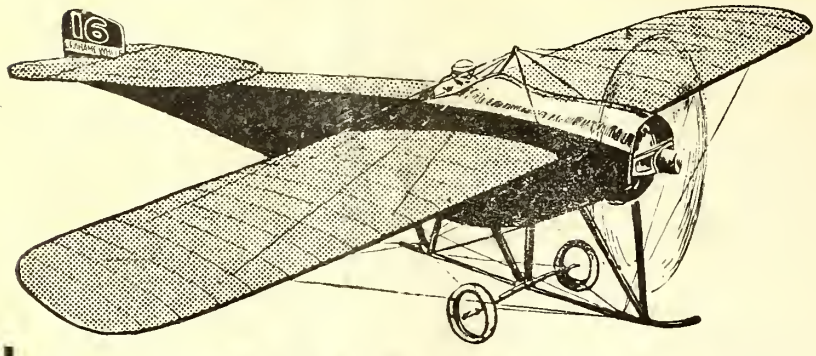

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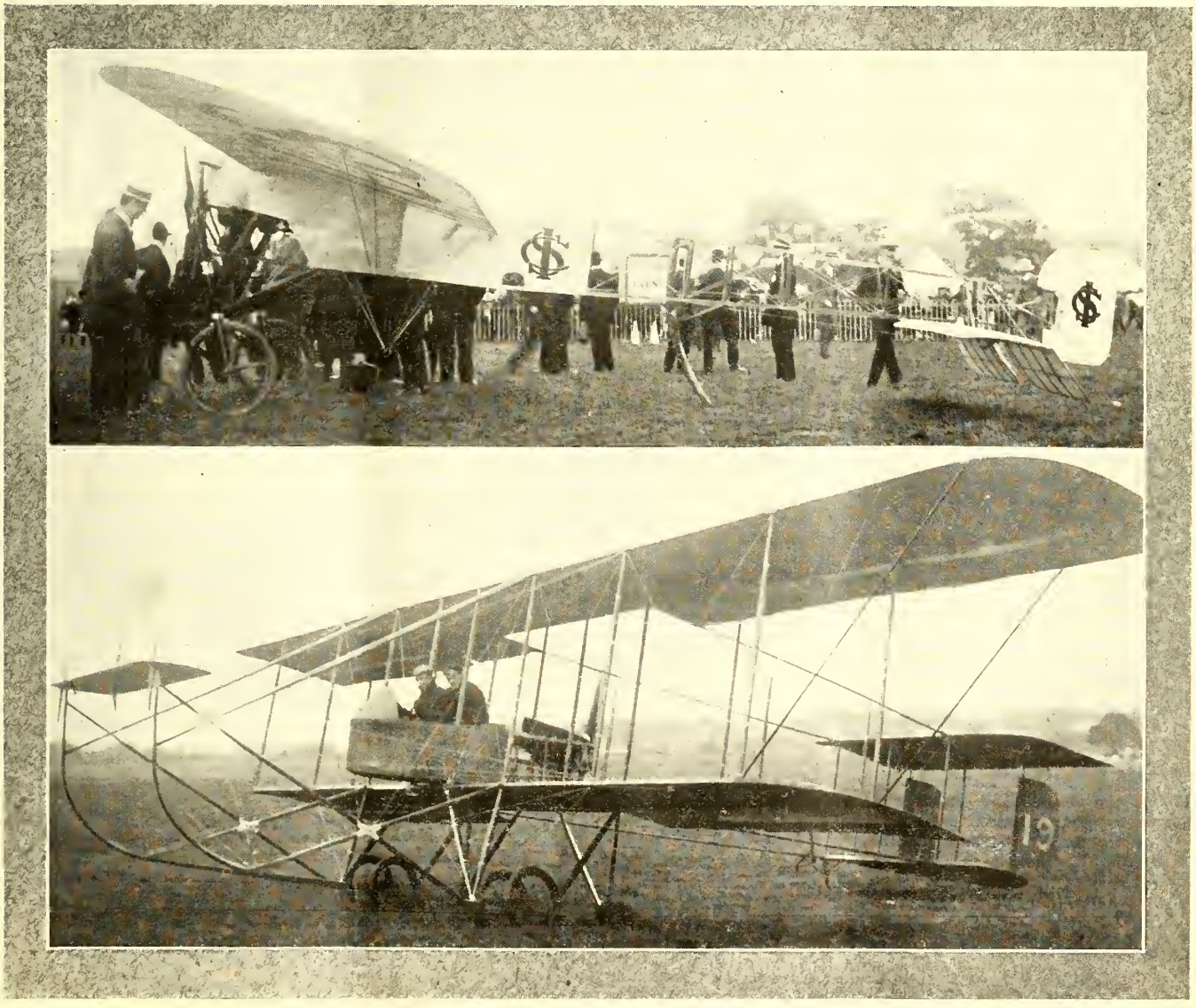
TWO NOTABLE MACHINES.



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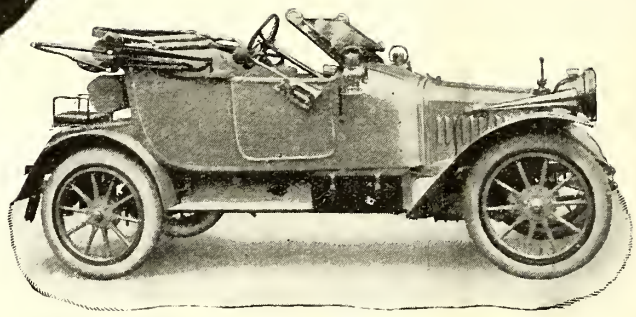

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THE COMING OF THE HYDRO-AEROPLANE

That the hydro-aeroplane, water-plane, water-flier, aquaplane, or aquaeroplane—whichever one likes to call it—has come to stay, or, rather, to fly, is now, of course, accepted as a fact of our everyday existence; and Mr. Holt Thomas's most entertaining discourse on the subject to the Aeronautical Society at the Royal Automobile Club on Wednesday last week was an important stepping-stone towards its ultimate success. It is a pity that more people of importance were not present, but even as it was there was quite a good attendance, and the matter and manner of the address made it quite one of the most valuable, and at the same time one of the most amusing, to which the members of the society have yet been privileged to listen.

In spite of the lecturer's disclaiming any knowledge of the subject beyond visual knowledge, he managed to impart a deal of information and to provide even more food for thought. The writer, therefore, proposes on this occasion to depart from precedent and to deal with the lecture in this section of the paper, so that comment may be made on Mr. Holt Thomas's leading points as they occur.

By way of prelude he remarked that, beyond having seen all the leading hydro-aeroplanes and having flown on the winning machine at Monaco, he lacked all knowledge on the subject; but he believed there had been more experiments tried in England than in France, Mr. Wakefield and Commander Schwann, R.N., being the pioneers in this country. Mr. Holt Thomas, however, omitted to say that the first machine which actually quitted the water in this country was that of Mr. Gnosspelius, on Windermere, a monoplane with a single central float of Fabre type. This machine has since been flown very successfully by Mr. Kemp.

The lecturer said that M. Fabre, in France, had been at work longer than the British experimenters, but not with as much success. He thought that most experimenters did not pay half enough attention to their aeroplanes, and suggested that if M. Fabre had attached his efficient floats to the most efficient plane he would have flown long ago, as was shown by the satisfactory behaviour of his floats at Monte Carlo on Caudron and Voisin machines. Mr. Holt Thomas advised constructors not to trouble themselves so much about the floats, but to go for the most efficient aeroplanes, preferably those of large surface and variable speed. They should then fit the most efficient floats, and should afterwards fit the floats in the most efficient position.

This is undoubtedly sound advice, for, given an aeroplane of known capability and a pilot who is used to flying it, one can at once tell the comparative values of the various floats. Mr. Gnosspelius and Commander Schwann both went to unnecessary trouble and expense through neglecting this method of procedure. The former had three unknown quantities—his float, his machine, and himself as pilot. When Mr. Kemp took the machine in hand it flew almost at once, showing that the machine and float were efficient. Similarly, after Commander Schwann had had one or two accidents, Mr. Sippe went to fly that machine, which was of proved ability, being an old Avro school biplane; it flew well almost immediately, the only absolutely unknown quantity being the floats. These proved efficient as floats, but inefficient as hydroplanes, as will be explained later on.

Mr. Holt Thomas pointed out that in the various accidents at Monte Carlo the light machines came out better than the heavy ones. With the motors available to-day most of us could build machines that would fly, but very few could build a flying machine.

Here Mr. Holt Thomas touched on one of the great troubles in the present stage of development. As in the French military trials last autumn, nearly all constructors are trying to get results by simply cramming on power. The Gnôme engine, starting as a nominal 50 h.p., which gave about 40 h.p., became a 70 h.p. last year, and the most recent product is an 80 h.p., still of the seven-cylinder type, while all these powers can be doubled by making them into fourteen-cylinder engines. We are really still a long way from a really efficient flying machine, though the little Caudron, in the Circuit of London, with its 45-h.p. engine, showed that some progress is being made. It should not, however, be necessary to put 70 h.p. into an aeroplane of any type to make it lift two people satisfactorily at 60 miles an hour, either from land or water.

As Mr. Holt Thomas said, the mere act of landing on sea is difficult. Land, at any rate, stopped still for one to alight on, whereas the sea apparently went for the floats as soon as it saw them coming. Commenting on the ease of hydro-aeroplaning, he said that Mr. Henry Farman took him up as a passenger the first time he tried to fly a hydro-aeroplane, and the attempt was quite successful. They went out of the bay at Monaco into the open sea deliberately searching for waves, although the sea at the time was described by a British naval officer as distinctly choppy. After his return to England he heard that the aeroplanes had been flying in real gales and that Fischer had started in a big wind on a flight to Genoa, but had turned back because he could not even fly in it.

On this question of ability to start from and alight on rough water depends the utility of the hydro-aeroplane for deep-sea use, and the information given by Mr. Holt Thomas is, therefore, of the more value. For pure coast-defence work there will always be comparatively calm harbour water, but till the hydro-aeroplane has shown its ability to float undamaged in a really big sea its value with a fleet in being remains problematical.

The Question of Floats.

The difficulty of saying what actually was an efficient float was the next point raised. He had written to various constructors, but they were not willing to give particulars. At any rate, he thought the floats must be built on aeroplane lines—that is to say, with a maximum strength for the minimum weight. The Fabre floats were made of wood and canvas. The Farman floats were built on a wood frame covered with cedar sheeting and braced with steel. Those on the successful Farman machine at Monte Carlo had never been tried on water prior to that meeting. The floats were constructed from models which Mr. Henry Farman had tried on a millstream by the simple method of towing them with a string. The position of floats on a machine was most important, for if in the right position it was extremely hard to turn the

machine upside down. He himself thought that they should be placed well forward and at the same angle as the machine itself. The Maurice Farman machine was at first fitted with wheels and floats. As illustrating the suction of the water, Mr. Holt Thomas said that, with the wheels only 6 in. deep in the water, it was impossible to get the machine to rise; but when the wheels were taken off it lifted six passengers. There was, however, nearly always difficulty in getting the last few inches of a float out of the water.

There is one method of comparing the efficiency of floats which may be of interest to Mr. Holt Thomas and others. The writer has been told on good authority that Mr. Sippe found it quite impossible to get Commander Schwann's Avro biplane off the water with the wind behind, but it would always lift head to wind, thus showing that the two floats were merely floats, and had to be hauled out of the water by the planes. When going down wind the drag of the floats in the water was so great that they could never be forced along fast enough to give the machine her lifting speed in excess of wind speed. On the other hand, Mr. Kemp found that the Gnosspelius monoplane got off much quicker with the wind behind than when head to wind, because when going down wind the single central hydroplane forced itself and the machine off the water almost before it had reached its flying speed. Against the wind the planes had to lift the float out of the water, which they did with comparative ease.

The inference that six inches of four wheels in the water absorbed as much power as six passengers must surely be wrong, and rather points to the accuracy of Mr. Astley's statement in The Aeroplane at the time of the Monaco meeting, that Renaux was delayed at the start by having to tune his machine and engine. There would, of course, be a great deal of resistance in the wheels, but not as much as that. By the way, talking of wheels in water, one of our most experienced experimenters said the other day that if the wheels of an amphibious chassis are in water, with the hubs above the surface, when the machine runs forward the wheels turn as if it was going backwards on land. There is a pretty problem in hydro-aero-dynamics for investigation.

Accidents with Hydro-Aeroplanes.

At Monaco Mr. Holt Thomas saw many accidents without danger to life. One machine landed upside down in the water with three people on board, and several others either turned over or sat down backwards. In every case the machines floated, and the passengers sat on top of them and waited to be picked up. If some of the smashes had happened on land and the crew had not been killed it would have been an accident.

On this point one feels that Mr. Holt Thomas's praiseworthy enthusiasm has rather carried him away. Certainly the danger is lessened, but it is not abolished. For example, St. Croix Johnstone was killed outright by a fall into Lake Michigan, in a machine of Blériot type, the shock of hitting the water smashing him against the front of the machine. It is pretty certain, also, that if a machine of the Curtiss or Henry Farman type took a real header from anything over 100 ft. the man, who would hit the water first, would either be flattened out by the impact or would have his back broken by the heavy parts of the machine behind him. In the Maurice Farman type the elevator and its struts, and the little boat body for the pilot, would probably break the surface of the water, and the chief danger would be of getting entangled in the wires, tanks, engine-housing, and other things which are behind, and being held down and drowned. In the Short type of tractor machine, and in that now being built by Mr. Sopwith at Brooklands, there is plenty of stuff in front to make a hole in the water, and the pilot need not be smashed up against the front of the machine if he wears a belt. In these machines, also, an emergency exit is provided in the rear edge of the upper plane through which the crew can dive out if she begins to turn over. A photograph was shown of one of the Curtiss machines standing on its head in the middle of a mighty splash, and it was explained that the pilot was unhurt; but evidence points to the fact that the machine hit the sea float first, and then somersaulted, so breaking the impact. A straight dive would have been another story. Still, if the same smash had happened on land someone would have been hurt.

As a sport, Mr. Holt Thomas said that hydro-aeroplaning was magnificent, and was much better even than motor-boating, because there was so much more variety. One could skim along the water at 25 m.p.h. like a motor-boat and then get out of the water and hop over the Isle of Wight if one wanted to. The aviators at Monaco often amused themselves jumping the promonteries along the coast.

For Naval Use.

From the naval point of view Mr. Holt Thomas pointed out that the hydro-aeroplane was already a fact. It would be useful for wireless purposes, as giving much better elevation, and had great possibilities for bomb-dropping. Bomb-dropping on the deck of a battleship might do considerable damage, and if a live bomb could be got down the funnel it would cause considerable inconvenience to the engineers.

He hoped, however, that no attempt would be made to fit aeroplanes to existing battleships. It would hamper designers considerably if they had to make aeroplanes to go down a hatchway, say 3 ft. 6 in. by 2 ft. 11 in. It was easier to make a special ship to carry the machines with spare wings, spare motors, and spare aviators. He regarded such a ship and its equipment simply as an insurance on the price of a Dreadnought. He believed that a modern battleship could make a lee in which hydro-aeroplanes could land, especially if assisted by oil on the troubled waters. He hoped that the Navy would provide a large fleet of hydro-aeroplanes, for the cost of such a fleet would be nothing against the cost of battleships, and he recommended sportsmen to take up hydro-aeroplaning at once. The hydroplane pure and simple was not nearly such fun.

Here, again, one feels inclined to disagree in part. The writer has high naval authority for stating that no bomb which an aeroplane could carry would penetrate the deck of a battleship unless dropped from something over 3,000 ft., and from that height the chance of a hit would be small. The chance of getting one down a funnel would be many times smaller still.

Further, it seems practically certain that every ship will carry aeroplane scouts, which are not hydro-aeroplanes at all, so that aeroplanes will have to go down regulation hatches, though it is also possible that there may be specially-built very fast mother-ships equipped solely for aeroplane work. Mr. Holt Thomas's idea of alighting on oiled water under the lee of a battleship is a very sound one and well worth trying as soon as possible. As to the sporting side of water-flying, there can be no two ideas on the subject, for it combines all the fun of motoring, hydroplaning, and hunting; and what more can the heart of man desire?

Most interesting photographs of the various hydro-aeroplanes at Monaco, of the *Water-Bird* on Windermere, and of the Avro at Barrow were shown, as well as kinematograph films of the Monaco meeting.

The Discussion.

After Mr. Berriman had instructed the audience as to what a hydro-aeroplane really was, and after Mr. Dunne had explained that he was a child in this matter, Mr. O'Gorman said that he would now address himself to Mr. Holt Thomas's last six inches. He said that the centre of support of the floats was obviously under the centre of gravity of the machine. The floats must be placed forward to prevent the machine from capsizing. As the floats lifted, the centre of support travelled back. The last six inches of the float only left the water after the original centre of support had done so, and the new centre of support given by the last six inches formed a couple with the weight of the machine, and consequently the machine tried to fall forward all the time the pilot was trying to get it up.

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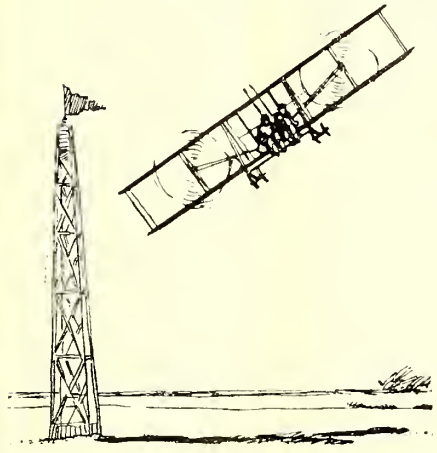

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The writer would like to suggest that the experiment might be tried, in a tractor machine, at any rate, of setting the nose of the engine slightly upward, with the idea of the pull of the screw setting up a counteracting couple, which would be balanced by the elevator when the machine got into the air. It would, however, probably make the machine awkward to fly.

As to the shape of hydroplanes, Mr. O'Gorman said the Sanders had a step which kept the centre of support well forward. The Thorneycroft had a flat bottom, broad in front and tapering aft. The Wright floats had several steps, with air ducts leading from one to the other. He said that the weight of a rough float to lift under a thousand pounds was about one hundred and twenty to one hundred and forty pounds. The effect of water on propellers was of great importance, and a real waterproof glue was badly needed. He thought that it would ultimately be possible to turn a boat into an aeroplane, but that propeller diameter was one of the great difficulties.

Mr. O'Gorman also sympathised with Mr. Holt Thomas over the difficulty he had experienced in getting particulars of floats from various manufacturers, for he himself had sent a similar request to Mr. Holt Thomas without receiving the information he required. As a matter of fact, when one comes to think of it, manufacturers are not likely to be anxious to part with their dearly-bought knowledge till they have produced a finished article and it is no longer worth while concealing what any purchaser and his friends can see for themselves.

An Immense Idea.

Mr. A. R. Low, of Vickers, Ltd., said that his experience of hydro-aeroplanes was confined to the drawing-board, but perhaps he might be permitted to hazard a guess at the lines of development. In the days of sailing ships the largest fore-and-aft rigged ships were the fastest, but when they came to square rigged ships the bigger the ship the slower it became. When steam-driven ships were developed this idea still prevailed, and consequently the biggest ships were the slowest. In these days it was discovered that the bigger ships were built the faster they could be driven. The coming of internal-combustion engines suggested that bigger and bigger ships would be built till one arrived at a ship which was all hull and engines like a racing motor-boat. One then reached a limit in the size of construction, and came back to hydroplane scouts. These, again, would be developed to their limit till one might arrive ultimately at a hydro-aeroplane scouting ship for naval purposes. This theory of Mr. Low's opens up immense possibilities for the hydro-aeroplane, and will be new to most people. The idea of a real flying cruiser is immense.

Mr. Alec Ogilvie, when called upon, said that the only experience he had had of hydro-aeroplanes was with Mr. Frank McClean, who would doubtless tell them something on the subject; and Mr. McClean, more or less under protest, said that he had only been out for two days on his Short hydro-aeroplane, but in that time he had learned quite a good deal. One could easily get a 40-m.p.h. machine up to a speed of 30 m.p.h. on the water, but then it was hard actually to get it off. The last attempt to lift the machine off the water with the planes might "stall" it—that is to say, get it beyond its proper flying angle, so that it simply hung for a moment and then pancaked. The act of landing on water made the building of floats difficult, for when landing on solid ground, the machine bounced after it first struck, and so moved sideways; but with floats one was actually putting something *into* the water which held.

He thought that for naval purposes motor-ships with double hulls and lifts to handle the machines would come into use. Mr. McClean said that flying over land had more variety about it, but a sea wind was steadier. One of the difficulties that he had met was that of accurately judging the height of the machine off the water; after getting up to only 20 ft. it was difficult to tell whether one was 5 ft. or 1 ft. from the surface.

This confirms a note from Windermere in The Aeroplane last week, in which it was stated that Mr. Stanley Adams—who, as pilot of the *Water-Bird*, has the honour of being the first regular pilot of a hydro-aeroplane in this country—found difficulty in judging height when landing on still water. In a breeze, the ripples give a measure of distance, but on still water one sees considerably below the surface.

Something Quite New.

Mr. Harry DelaCombe said that he had recently seen a hydro-aeroplane in France, flown by a British pilot, which flew between 60 and 70 miles an hour with a 50-h.p. engine, carrying a pilot and passenger. It rose from the water in a run of 100 yards, though it had only 17 square metres of surface. The float had a step, and it rose from the water without any lag. It landed with a shock, but one that was not so bad as that of a hydroplane boat, owing to the planes still carrying some of the weight. He said he could pack a dozen of them into a department the size of a torpedo department on a battleship. He thought a machine of this kind would save all the trouble of building special ships.

The British pilot to whom Mr. DelaCombe referred has been good enough to show the writer photographs of this machine, and it is certainly a startling departure from current practice. With slight alteration it should make a very safe and efficient vehicle, and its arrival in this country at an early date should cause something of a sensation.

Mr. Holt Thomas, in replying on the debate, said the Henry Farman floats weighed about 75 lb. each. The difficulty of water on the propellers was got over by covering about two-thirds of the propeller with thin brass. He still considered that it would be better to have the aeroplane scouts at sea on a special ship of their own, which would keep outside a general fleet action, for he did not see what a pilot would do in war time if he left his ship and endeavoured to get back to it while broadsides were being fired.

This point of view is undoubtedly sound, but at the same time there is no doubt that, when not actually going into action, aeroplane scouts would be of great value to the ordinary battleship, especially to a single ship detailed for special duty apart from the fleet. There is no reason why the big hydro-aeroplane attached to a special mother-ship should not exist at the same time as the small scouts which are not meant to get off the water, and both may still exist even when Mr. Low's suggested hydro-aeroplane cruiser comes into being.

The whole subject is most fascinating, and it is only hoped that this somewhat lengthy discussion will suggest further ideas, and will help to generate still more interest.

The Royal Aero Club.

A meeting of the General Committee of the Royal Aero Club was held on the 11th inst. There were present:—Mr. Roger W. Wallace, K.C., in the chair; Royal Aero Club—Mr. Griffith Brewer, Prof. A. K. Huntington, and Mr. C. F. Pollock; Aero Club of Ireland—Mr. John D. Dunville; Bristol and West of Scotland Aero Club—Mr. A. E. Catford and Mr. P. Evans; Aeronautical Society of South Africa—Major A. M. Rogers; Harold E. Perrin, secretary. The financial statement for the year 1911, showing a balance in hand of £88 10s. 5d., was submitted and adopted. The capitation fees received to date for the current year, amounting to £217 0s. 8d., were reported.

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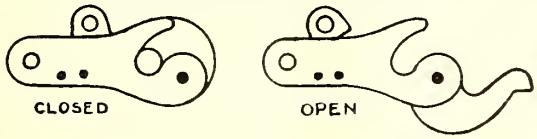

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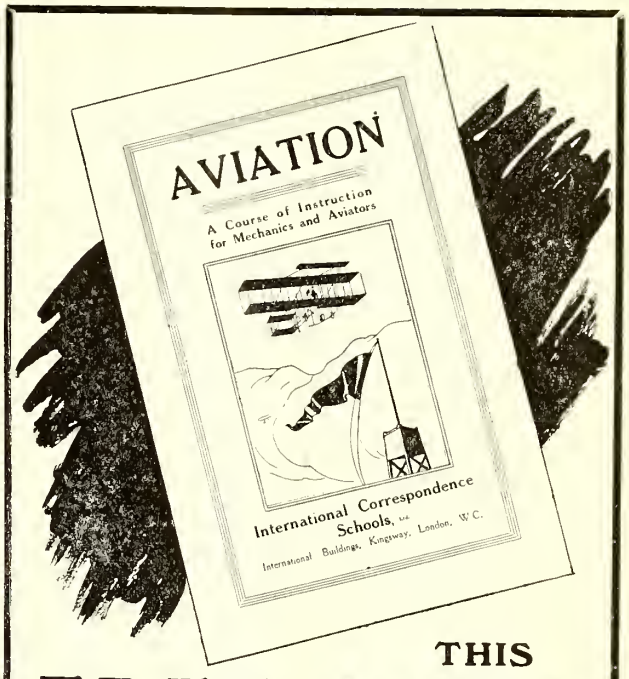

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The Enlistment of Mechanics in the Royal Flying Corps

BY W. E. de B. WHITTAKER.

In the various speeches, articles, and discussions of the formation and organisation of the Royal Flying Corps, with few exceptions, the subject has been confined, so far as personnel is concerned, to the commissioned ranks only. Those who fly under present conditions are so accustomed to adulation from the great ones of the earth that such questions as interest the rank and file have no interest in the world. An army badly led will fail in the field; but, on the other hand, the most efficient officers are useless if the lower ranks are essentially inefficient. Efficiency ordains that there shall be homogeneity between all ranks of the Army.

Enlistment in the cavalry and infantry of the line presents no difficulties. There is always an almost adequate supply of men. Physical condition is practically all that counts. Mental efficiency is hardly considered. It is not required of a private soldier that he be a scientist or a theoretician of any sort. His mental equipment need not be extensive. He is expected to obey unquestioningly, and the type of initiative demanded of him does not require a highly trained brain. Lack of knowledge is more desirable than the badly assimilated half-knowledge of, say, the average Territorial. While of no practical use, it is frequently subversive of discipline, and high discipline is one of the secrets of success.

A recruit in any but the specialised services must know enough to keep his rifle and accoutrements in order, and how to use them, up to a certain standard. Beyond that, little is necessary. The deepest knowledge of tactics or strategy avail him little, and will probably induce a feeling of nervousness when under fire, or when in any position in which the G.O.C.'s opinion does not coincide with his own. Any ordinary man without special knowledge can become in six months an efficient soldier.

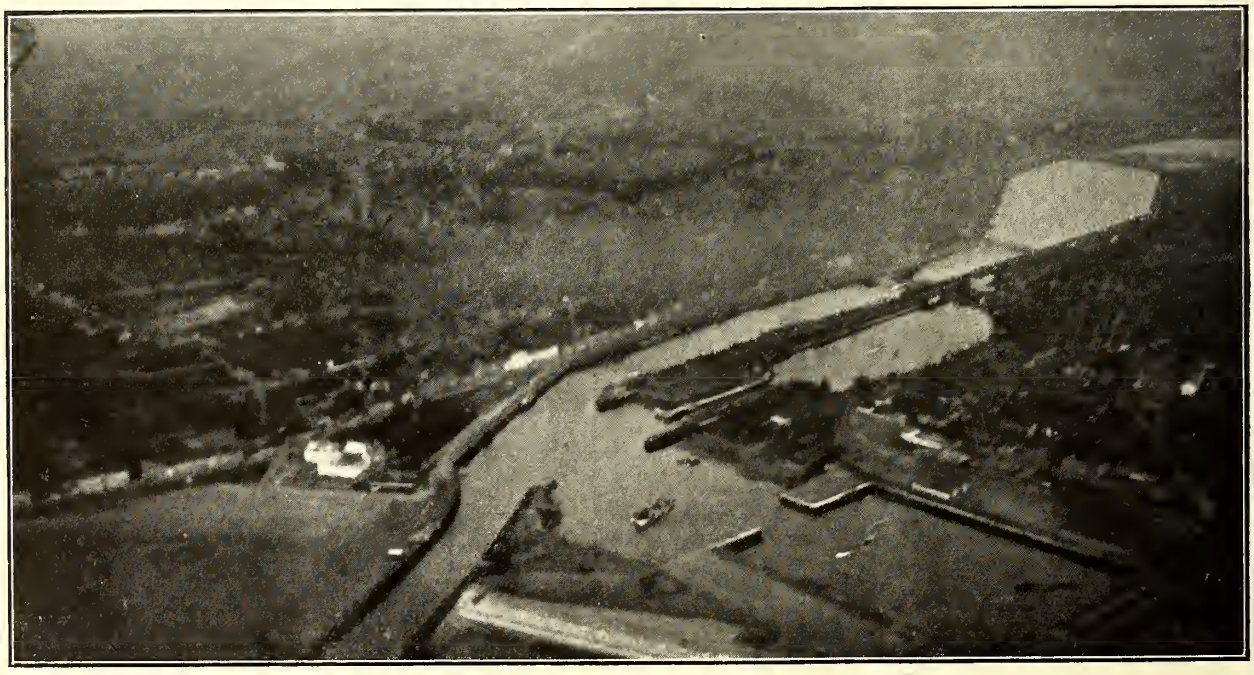
But there are corps in the Army controlling duties which involve a certain amount of special training, and, moreover, training the rudiments of which must have been acquired before entering the Service. In civil life this training is rewarded by higher remuneration than is the case in unskilled labour. Consequently the rates of pay in the Army have to be increased in these skilled branches of the Services if there is to be sufficient inducement to attract men to join. And so it is in the Royal Engineers, where the pay varies greatly, according to the duties performed. The Royal Flying Corps brings within the Army another highly scientific branch requiring a large number of men possessing special qualifications.

The mechanic class as a rule looks with disdain on the Army, and for many reasons, but chiefly because it represents restriction of freedom. Moreover, the cash remuneration is never quite equal to that received in a civil trade. A man in ordinary employment, if he does not care for the local climatic conditions, or is annoyed at the singular lack of good form on the part of his employer, can leave when he likes. In the Army, once enlisted, he has to remain a soldier until his time is up, or until he misbehaves himself in a sufficiently serious manner. There are, consequently, certain men of a good stamp to whom an Army life would be insufferably irksome.

The aeroplane mechanic is at present a class to himself. He conforms to no rules, and is independent to a degree. The demand for men with practical experience is greater than the supply. The better type of man receives pay far in excess of his social position, whilst the lower type is equally useless in or out of the Army.

An Army order has recently been issued, regulating the conditions of enlistment in the Royal Flying Corps, and giving full particulars of the pay and allowances granted. It points out in the first paragraph that "men enlisting in, or transferring to, the Royal Flying Corps, Military Wing, will be required to undergo such instruction as may be necessary, and to perform any duties that may be required of them in connection with the care, management, and navigation of all forms of military aircraft in the air, or on land or water. They will, further, be liable to be employed either for naval or military purposes as required." . . . It will be observed that there is a possibility of men having to serve at sea. It is possible, but not probable.

The age and physical standards required are given in paragraph 2, but are nullified by the clause, "candidates not in all respects eligible as to physical



Boulogne Harbour from above. Photographed by Miss Trehawke-Davies at 3,000 feet, during her last crossing with Mr. Hamel.

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standard, but otherwise qualified, may be specially considered for enlistment," which means that for the present mechanics will be accepted, according to their practical ability, apart from their age or physique.

The terms of service are for "four years with the colours and four years in the Reserve." It is proposed to allow of extension of service with the colours, but no conditions are as yet published. On being transferred to the Army Reserve, soldiers of the corps will receive a gratuity of £10 per annum in lieu of Reserve pay.

I cannot do better than give in full the paragraphs stating what classes are required. They are as follows:—

"(*a*) Men who have served as an apprentice or improver in a general mechanical engineer's workshop, and, in addition, have served on full rate in a petrol motor engineering works, including experience in the engine test shop, or have served as an aeroplane mechanic. They should have a good knowledge of general motor engineering, a thorough knowledge of the principles of magneto and coil ignitions, and be able to make intelligible sketches of machinery details, and rough calculations connected therewith.

"(*b*) Men of the following trades: Blacksmith, carpenter and joiner, clerk, coppersmith, draughtsman (mechanical), electrician, fitter and turner, harness maker, instrument repairer, metal turner, painter, photographer, rigger, sailmaker, tinsmith, wheelwright, whitesmith, wireless operator, wood turner.

"(*c*) (i) Men of any of the following minor trades: Cable jointer, chauffeur, driller, dynamo attendant, electric-bell fitter, joiner's helper, machinist, motor fitter, plumber's mate, switchboard attendant, tool grinder, wireman.

"(ii) Men above the average intelligence, with a certain amount of education equivalent to the standard of a 3rd class school certificate.

"Men of Class (*a*) specially selected by the Officer Commanding, Military Wing, Royal Flying Corps, may on final approval be at once promoted sergeants to fill existing vacancies on the establishment. It must be understood that men so promoted will be on probation for one year, and will be liable to discharge should they not prove fitted for the duties of the rank in the Corps.

"Those of Class (*a*) or (*b*) who on enlistment successfully pass a trade test in one of the required trades will be graded as 1st class Air Mechanics from the date on which they are finally dismissed from recruit training.

"Those of Class (*c*) will be enlisted and graded as 2nd class Air Mechanics."

The daily rates of pay are as follows. I add to each in brackets the amount received daily in the same rank in the Royal Engineers to demonstrate clearly the favour shown to the Royal Flying Corps:—Warrant Officer, 9s.; Sergeant, 6s. (6s.); 1st class Air Mechanic, 4s.; and 2nd class Air Mechanic, 2s. (1s. 1½d.). This pay is subject to no deductions, as an additional messing allowance is made.

It will be realised how much better off financially the Flying Corps mechanic is than his brother in civil life. He has a safe position, and the knowledge that, if injured, he will receive an adequate pension. His health is carefully guarded, his hours of work regular, and his food excellent. The country provides him with uniforms, and at the same time, if his conduct warrants it, grants him permission to wear mufti on furlough.

The change in the conditions of life is great. The cheap, uncomfortable lodgings are replaced by spacious barrack-rooms. The day of irregular work, and night of limited sleep, alter to regular hours. He is certain of continuous employment for his term of service, and his prospects are good afterwards. No man can serve four years or more in a special service without gaining experience which adds considerably to his value in civil life. The difficulty of finding employment for time-expired soldiers only applies to rankers of the cavalry and infantry who have no specialised knowledge.

It is intended to select warrant officers, N.C.O.'s, and men for training as military aviators, and they will be sent to the Central Flying School for that purpose. During their course of training they will receive flying pay at the rate of 1s. a day. If at the termination of the course they pass the tests imposed, they will receive flying pay at the rate of either 4s. or 2s. a day, according to their proficiency in the art of imitating the antics of a languid bird. At half-yearly intervals it is required that they shall pass specified tests, lack of success in which will result in the loss of their flying pay. On their relative proficiency they will be graded as 1st or 2nd class fliers.

Those N.C.O.'s and men who serve in the "Airship and Kite Squadron will, unless they are qualified aeroplane fliers, receive flying pay at the rate of 2s. a day only for days on which they make an ascent by airship or kite."

Each man, in addition to his daily pay and daily messing allowance, will receive allowances for quarters or lodgings, "fuel and light, and rations of bread and meat." After the end of the first year's service a clothing allowance is also make quarterly.

Extra allowances are also made to men on the married roll, which are increased if they "are unavoidably separated from their families owing to the exigencies of the Service."

There is engaged in aviation a limited class of men who, while of the highest character and intelligence, are debarred by lack of means or even inclination from entering the commissioned ranks of the Service, who would make excellent servants of the King. A little consideration will show such men that they will gain rather than lose by joining the aviation section of His Majesty's Service. The fear of rigid discipline deters a great number from enlistment, but that fear is greatly exaggerated. It must not be forgotten that the officers who administer that discipline are at the same time human beings, and, except in a few isolated cases, are in the habit of treating their men with every consideration.

The aviation mechanic, so far as the majority is concerned, is an honest, hard-working, intelligent man; but, as in every trade, there is a certain blatant class of mechanic who is heard and seen in inverse proportion to his efficiency. Those who have much aerodrome experience will no doubt agree with me that a minority, infinitesimal in number, has done great harm to the aeroplane mechanic as a class, by reason of its shiftlessness, incompetence, and sneering method of behaviour.

No one appreciates more than myself the devotion and skill of the great majority of those who do the groundwork of aviation, and I should not like it to be thought that I have not great admiration for them as a class.

In the present state of aviation men can do much worse than enlist in the Royal Flying Corps.

Military Aeroplane Competition, 1912.

At the request of several British aeroplane manufacturers the Club approached the War Office with a view to obtaining a postponement of the date of the competition. Mr. Howard T. Wright, Mr. R. L. Charteris, and the secretary attended at the War Office on the 5th inst., and explained the position of the manufacturers. As a result of this interview the War Office has now announced that the trials will be postponed till July 31st, 1912, and that entries will be received up to June 21st, 1912.

The Royal Flying Corps.

Captain G. H. Raleigh, Essex Regiment, has been appointed to the Royal Flying Corps.—W. E. de B. W.

French Military Notes.

An interesting experiment has been made at Buc. A Maurice Farman biplane has been, during a period of twenty days, kept in the open air without covering of any kind. Each night the biplane was roped to the ground, the weight of the machine resting on the skids—the wheels being sunk into trenches. Each

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day, after a careful inspection by a military commission, M. Fourny made several flights to demonstrate its complete immunity from damage through inclement weather. The aeroplane was at the end of the period no worse at all, except perhaps as regards appearance.

A military commission under the command of Commandant Labadie examined, by request of M. Sommer, the remains of the Sommer monoplane on which Kimmerling went to his death. The commission decided that the accident was caused by the breaking of a warping cable when the machine was about 150 ft. high. The extra strain thus imposed on the remaining cable broke that, and the wing came away from the fuselage. As a result of this report Colonel Hirschauer has forbidden further flying on Sommer monoplanes until a slight modification has been made in the method of attaching stay wires.—W. E. de B. W.

French Naval Aviation.

The French Navy has officially accepted delivery of the Voisin hydro-aeroplane (*type canard*) which has recently passed the specified tests in the bay of St. Raphaël, piloted by M. Colliex. Lieut. de Vaisseau Cayla is placed in charge of the machine, which, as has been stated before, is stationed on the *Foudre*.

The Ministry of Marine is purchasing a large number of aeroplanes, and rows of hangars are in course of erection at the Fréjus naval aerodrome.

M. Paulhan on June 10th made several flights on the Curtiss hydro-aeroplane in the presence of Commandant Fatold. At the conclusion of the demonstrations his machine was hauled on board the *Foudre*.—W. E. de B. W.

German Military Aviation.

A new Zeppelin dirigible (*Z.3.*) is to be stationed at Metz. The *Z.1.*, previously at Metz, is to be stationed at either Koenigsberg or Posen. To avoid the expense of building pivoted dirigible hangars, the Ministry of War is constructing several of which the entrances is a bell-mouthed funnel. By this means it will be possible for dirigibles to emerge in whatever direction the wind may be.—W. E. de B. W.

Military Aviation in the U.S.A.

From the somewhat meagre reports published in the daily Press, it appears that two officers of the U.S.A. Army Signal Corps, Lieuts. Hazelhurst and Welsh, were killed flying a Wright biplane at College Park, Maryland, on June 11th. Of the career of either officer I know nothing. Lieut. Hazelhurst joined the Aviation Section of the Signal Corps in February last.—W. E. de B. W.

A Bristol Pilot Abroad.

A reader of The Aeroplane in Germany sends word that some exceedingly fine flying has been done at Döberitz by Mr. Henry Jullerot on a Bristol military monoplane. The Germans, who are used to large machines of the Etrich type, which are slow on their controls, and only do about 45 m.p.h. with 75-h.p. engines, could not understand the Bristol doing over 60 m.p.h. and carrying a passenger with only a nominal 50-h.p. Apparently Mr. Jullerot specialised on cross-country circuit flying, for he made either five or six trips round a 50-mile circuit from Döberitz, which took him round Priort, over the Fahrlandsee, right over the Kaiser's palace at Potsdam, across the Havel, and over Charlottenberg and Spandau. Most of the time he is reported as flying at about 2,500 to 3,000 ft., and on several of these occasions he carried German officers as passengers. It is reported that there is already accommodation for about 75 machines at the military ground at Döberitz, and that sheds are being put up to house fully 200, so that, despite the scarcity of really good pilots, Germany evidently intends doing the thing properly.

Mr. Sippe's Plucky Effort.

Few of the many thousands who saw the old Dulwich College boy, Sydney V. Sippe, lead the way at the start of the Aerial Derby were aware of the big fight the young aviator had put up to make a start at all.

Telling his own story, Mr. Sippe says:—"I started from Reims with the Hanriot monoplane on Thursday morning, arriving at Boulogne at 9 p.m. Owing to the strike of dock hands the regular cargo boats had been suspended and there was no room for an aeroplane on the light freight boats.

"I crossed on Friday morning and went to London, where I interviewed the *Daily Mail* people, and told them of my predicament. They went at once to the general manager of the S.E. and C.R., with the result that the machine was shipped to Dover and arrived at 12.30 on Friday night. Then it had to be taken out of the crate and put in a covered van attached to the mail train, which arrived at Charing Cross at 4 a.m. on Saturday.

"From there to Hendon by horse lorry took us seven hours, and it was past 11 o'clock when I started assembling the machine. I just managed to put the finishing touches by 4 p.m., and the race began at 4.38.

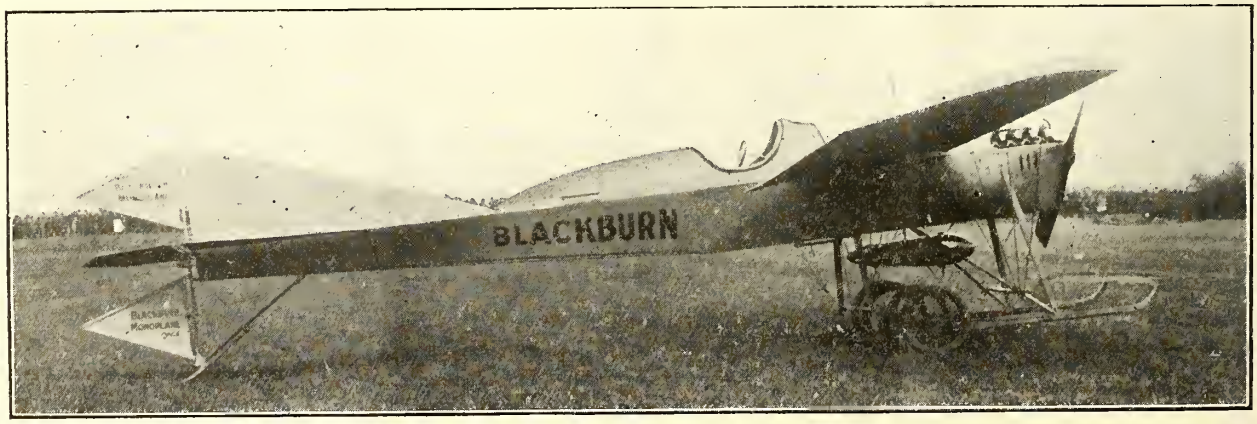
"My engine went very badly at the start, and the first turn I negotiated with the greatest difficulty. When I got outside the ground I found the wind very bad. It was very difficult to see landmarks, and I had extreme bother in getting up to 600 ft. At Hounslow my engine missed badly, so I glided down into the barracks. Some soldiers held the Hanriot whilst I ran the engine, and as it picked up I ascended and flew towards Kempton.

"At Esher I saw a Blériot in front of me, and guessing it to be Hamel, I followed for a few miles, but was again forced down at Chaldon. I again tinkered up the engine and again ascended for a few more miles. The next time the engine jibbed, which it did four miles further on, I gave up the attempt." Mr. Sippe deserves every praise for his plucky effort, and one can only wish him a full measure of success at his next time out.

Mr. Huck's New Mount.

Writing from Paris on June 16th, Mr. Hucks says:—"Have just tried out, at 5 a.m., new 70 h.p. two-seater Blériot, without passenger, at Issy, in 25-35 mile wind. Seemed to surprise onlookers. Made circle of Eiffel Tower. Find machine top hole in tricky wind. Rather different in landing owing to better gliding angle. Lands similar to Nieuport. Intended starting for Hendon, but wind bit too strong, and exactly on side. Decided to wait better conditions for such long flight on strange machine."

Mr. B. C. Hucks, with Mr. Harold Barlow, the well-known patron of aviation at Hendon, as passenger, flew on Monday from Issy-les-Moulineaux to Hardelot, covering the 160 miles in 140 minutes. Quite good going.



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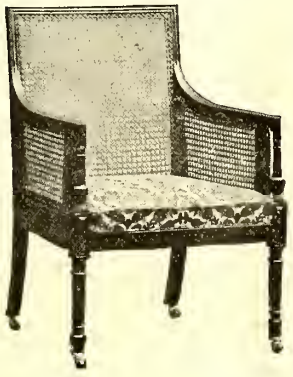

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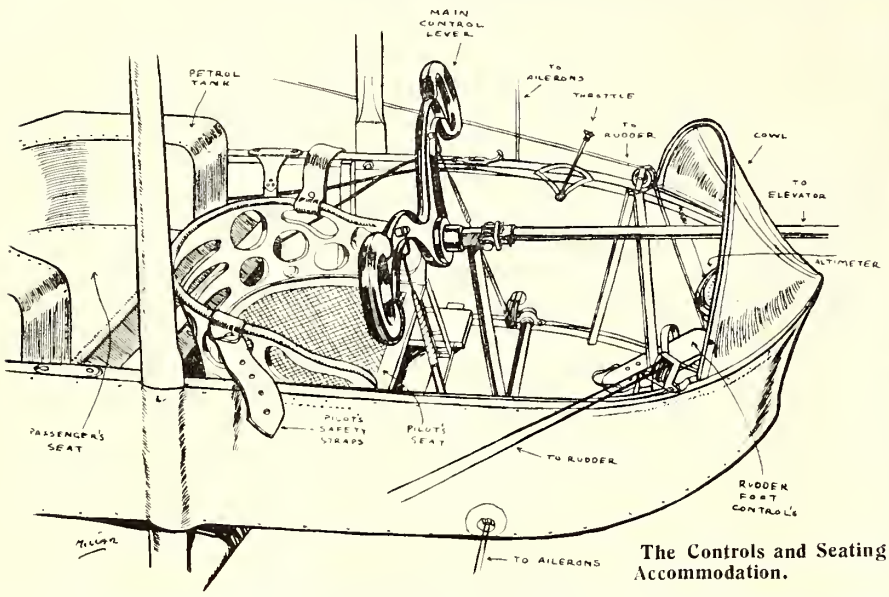
The Maurice Farman Biplane.



The Controls and Seating Accommodation.

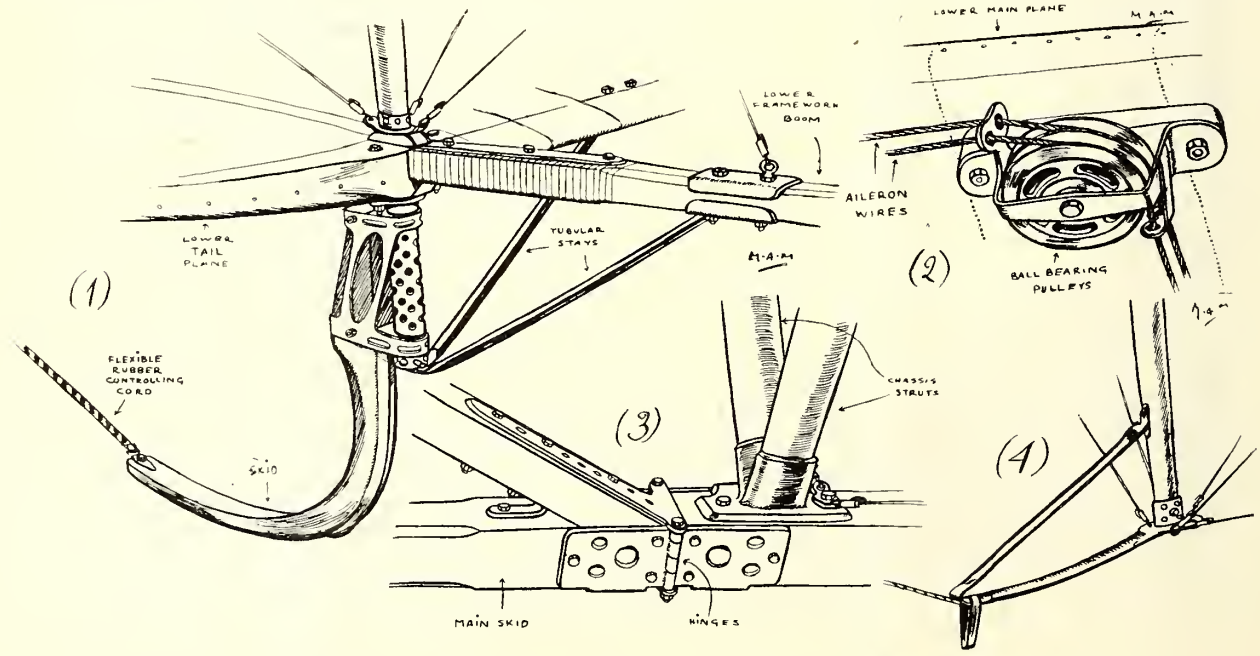
Any aeroplane constructed by one or other of the brothers Farman is viewed with interest. Unfortunately in Great Britain the majority connect the name with a certain type of biplane which, though its early performances assisted greatly in the advance of the new science, is now practically out of date in design. Until the last week or so, we have not had a later example of either the brothers' work than the 1910 pattern Henry Farman biplane—that is to say, under ordinary flying conditions. Machines placed on show demonstrate nothing except excellence of finish. Consequently few of us had any real knowledge of the capabilities of the modern standard type Maurice Farman biplane, and unqualified surprise greeted its performance on its first appearance at Hendon a week or two ago. Though M. Maurice Farman has not solved the problem of hovering flight, despite the public prints, the gliding of his biplane is extraordinary.

The speed of flight is high—about 56 miles an hour—and, more important still, there is a considerable variation of speed in the hands of the pilot. I was, I believe, the first passenger taken up by M. Verrier who was not a member of the firm. From personal experience I can vouch for the excellence of the machine's flying qualities. When in the air, the pilot cut down his throttle by about half, the propeller visibly slackened in speed, and yet we did not drop at all. We flew in a semicircle for nearly half a mile without M. Verrier touching his control lever. The rudder alone was used. And yet, though the day was by no means calm, the biplane was perfectly stable. It answers to its controls as quickly as a fast monoplane, and quicker than some, so that as one moves the handle-bar controlling the elevator and ailerons, the aeroplane obeys immediately and at the same speed.

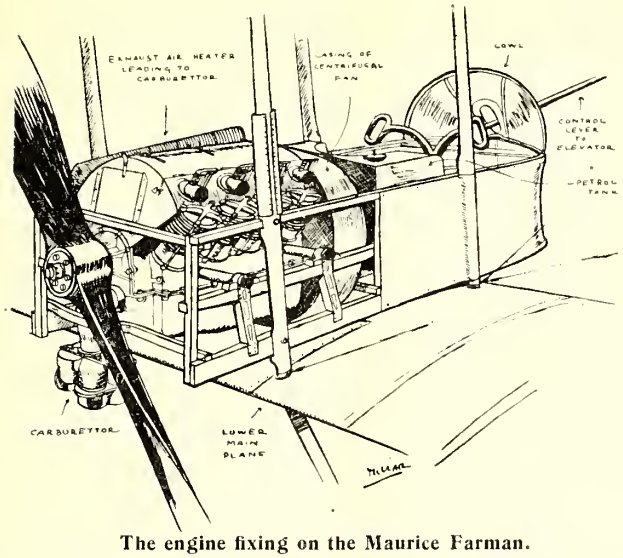
As to the danger, in the case of a smash, of receiving the engine in one's back, it is negligible. If the impact is severe enough for the engine to break away from its bed, the pilot will be sufficiently dead to prevent his being annoyed by the weight of a 70-h.p. engine. There are no deaths recorded which are traceable to the crushing effect of an engine leaving its position on a properly constructed machine. I have had as comprehensive a smash as falls to the lot of most people, and yet my engine never left its place on the rear spar. The increase in comfort and in effective range of vision effectually counterbalances any disadvantages of the engine-behind position.

The entire biplane is constructed with the greatest care, and is highly finished. The great majority of the spars, including the tail booms, are hollow. The hollow spars can be distinguished by a bright blue thread binding placed at intervals. A close study of the accompanying sketches will reveal many instances of neatness of design.

The plane section, according to Eiffel, is one of the most



(1) The castor tail skid, and jointing of tail booms; (2) how the control wires are guided round the pulleys; (3) jointing and fixing of skids and chassis; (4) aileron lever, showing how slack cable is taken up by a sector arm.



The engine fixing on the Maurice Farman.

efficient in use at the present time. A handle-bar controls the elevator by a backward or forward movement, and the ailerons by a rotary movement. Two foot pedals actuate the rudder.

The ailerons are of great length, and of slightly narrower chord than on the old type Farman. The act of depressing the ailerons on one side has the effect of raising the opposite flaps to a corresponding degree, thus doing away with the necessity for altering rudder position at the same time, as the retarding effect of the ailerons is approximately equal on both sides. All control wires are duplicated.

The principal measurements are as follow:—Span, 51 ft. 8 in.; length over all, 49 ft. 9in.; chord, 6 ft. 7 in.; gap, 6 ft. 6 in. Weight, with pilot, oil, and petrol, 1,606 lbs., or 1,250 lbs. empty. Engine, Renault, 8 cyl., air-cooled, 70 h.p.

The Aircraft Company, of which Mr. Holt Thomas is managing director, and which represents the Farman firm in England, intends to build these machines in this country. There will be no difference whatsoever in detail, and they will be absolute copies of the French machines in every particular.

W. E. de B. W.

A Desirable Corps.

One learns from Mr. W. H. Akehurst, the hon. secretary of the Kite and Model Aeroplane Association, that an effort is being made to form a Volunteer Corps to be called the Aeronautical Engineers, or the Volunteer Motor Kite and Wireless Telegraph Corps, the idea being, apparently, that there shall be a kite section equipped with motor transport which will eventually be part of the Territorial organisation much in the same way as the old Balloon Company of the Territorials, which is now to be disbanded. It would certainly be an excellent thing if there could be a properly equipped Territorial section of aeronautical engineers, as there are quite a number of men who cannot afford or do not wish to become aviators and join the Reserve of the Royal Flying Corps, but who have quite a large knowledge of aerodynamics and aero-mechanics, and would be very valuable in an actual corps of engineers operating man-lifting kites and wireless telegraph installations. One might, however, suggest that the Volunteer Motor Kite Corps is not a good title, as it seems rather to suggest a corps of volunteer aviators equipped with obsolete lifting-tail biplanes.

The Dover Aero Club.

On Wednesday last, the Marquess Camden (Lord Lieutenant of Kent) opened the new clubhouse at the Dover Aerodrome. There were large crowds at the ground, it having been announced that there would be some flying, but unfortunately the wind was far too boisterous. Signor Nardini left the Dover Aerodrome on Saturday week, in the evening, for Hendon, to take part in the Aerial Derby. Most unfortunately, after landing near Sittingbourne owing to his engine going wrong, while he was ascertaining where he was, he was told that his machine was on fire, and he had to watch it burn. The cause was probably through someone in the crowd which collected carelessly dropping a match, which set light to some waste petrol. He expects shortly to get a two-seater to Dover. Mr. Chalmers also had an unfortunate accident the same evening, his engine missing fire badly, forcing him to come down while over some woods, and the tail of the Farman caught in a hedge, breaking the propeller and a few wires, but otherwise no serious damage was done.

H. H. V.

Credit Where Due.

By an oversight the name of the Topical Postcard Company was omitted from the excellent portrait of M. Salmet published a fortnight ago, and from the photograph of the chairing in of Mr. Sopwith after winning the "Circuit of London," published last week. This firm has an excellent stock of photographs of the leading aviators and their machines, of which M. Salmet's portrait is a fair sample, and visitors to Hendon can obtain from their salesmen in the enclosures the best souvenirs of their favourite pilots.

The Aeronautical Society.

As a result of the ballot for Associate Fellowship, the following have been duly elected Associate Fellows of the Aeronautical Society:—Dr. F. A. Barton, A. E. Berriman, Robert Blackburn, Harris Booth, F. H. Bramwell, Capt. H. R. M. Brooke-Popham, Capt. C. J. Burke, Col. J. E. Capper, C.B., R.E., Prof. Herbert Chatley, Bertram G. Cooper, Horace Darwin, F.R.S., Harry Ferguson, Edward P. Frost, Col. J. D. Fullerton, R.E., B. Melvill Jones, H. F. Lloyd, Capt. E. M. Maitland, F. K. McClean, G. F. Mort, A. P. Thurston, W. R. Turnbull, W. Ellis Williams, Howard T. Wright.

The Death of W. D. Johnstone.

The Late W. D. Johnstone.

All those connected with aviation in this country, and many in France, will learn with the deepest sorrow of the death of W. D. Johnstone, who was killed in a motor bicycle accident on Friday, the 14th, near Eastchurch. He had gone to the Isle of Sheppey to fly the Dunne machines for a while, prior to taking over the Flanders machine for the Military Trials. On Friday morning he was driving to the Eastchurch ground from his lodgings in Minster, and, as was his custom, was driving fairly fast. In turning from the Minster road on to the main road, his brakes failed to act, and he hit some obstruction, probably a telegraph pole, on the opposite side of the road. His skull was fractured, and both jaws, an arm and a shoulder broken. He was first taken to the "Crooked Billet" at Eastchurch, where Dr. Wiglesworth and the surgeon of H.M.S. *Actæon* did their best for him, and he was then carefully transported to the infirmary at Minster, but the case was regarded as hopeless from the first, and he died about 6 p.m. without regaining consciousness. His mother, sent for at once from Weybridge, only reached his bedside shortly before he passed away.

W. D. Johnstone was one of the pupils of the Blondeau-Hewlett School at Brooklands, where he showed himself to be a flier of very great promise. After leaving that school he flew Mr. Jack Dare's Howard Wright biplane, and apart from the fact that he once or twice showed a tendency to be reckless, he gave further proof of his ability as a flier. This machine was wrecked in an accident in Yorkshire, and afterwards Johnstone joined the staff of Vickers, Ltd., by whom he was sent to Buc, where he did some really fine flying on the R.E.P. machines. On his return he spent some time in the Vickers works, but left the firm and went to the South of France, to try to make a French experimental machine fly. As the experiment was a failure, he returned to England a few weeks ago, and went to Eastchurch, where he unhappily met his death.

Johnstone was a young man of considerable ability and possessed a very decided personality, with the result that his personal friends were among the best class of those associated with aviation, the men of brain who do the hard and often unacknowledged work. He had excellent prospects in the City, where he had influential friends, but he had long desired to take up aviation as a profession. For some time he was in doubt whether to do so or not, but the sporting instinct was too strong in him, and he gave up a certain and lucrative position for the precarious existence of a professional aviator. Had he lived, he might have gone far, and many of us will miss his cheery presence and entertaining conversation.

He was the only child of his mother, who is a widow, and everyone will tender to her their heartfelt sympathy.—C. G. G.

The Week-end at Hendon.

In spite of the shocking weather, those who were brave enough to visit the London Aerodrome on Saturday last saw some very fine flying, small in quantity but excellent in quality.

The first man out was Mr. Louis Noel on one of the Grahame-White biplanes, and the way he was pitched about showed that none but a first-class aviator in a modern machine with plenty of power should venture out at all. After a wait Mr. Grahame-White also turned out and did some capital flying.

About 5 o'clock the biggest flight of the day was made by M. Verrier on the Maurice Farman, with Mr. W. E. de Whittaker, of The Aeroplane, as passenger. The machine got up quickly with a side wind and was very badly knocked about coming up head to wind. However, M. Verrier handled her beautifully and, without forcing her to climb, got up to something like one thousand feet in about two circuits. At that height the machine appeared comparatively steady, though one could see the strength of the wind by the fact that the machine was doing about 20 m.p.h. across the ground when facing the wind and apparently between 80 and 90 going down wind.

When M. Verrier made up his mind to come down, he cut off his machine when a little to the north of Hendon and started to glide head to wind, and came down to about 250 ft. over the railway bank, where he seemed to get all the upward gust over the bank and rose sharply. Then as he came through the gust the machine apparently dropped bodily about 40 ft. However, M. Verrier had her under excellent control, and, switching on at once, he brought the machine down under power in the neatest way possible. It is doubtful whether a passenger flight on a biplane has ever been made in so big a wind in this country, though possibly the worst of the Manville Competition days on which Mr. Pixton flew at Brooklands may have been as bad.

After M. Verrier's descent, Mr. Noel again went up, but as he was blown down three times in about one circuit, it was judged wiser that he should desist.

Mr. Slack, whose new Blériot looked very smart and business-like, was all ready to start, but as the landing ground at Bedford was very small and the length was the wrong way for the prevailing wind, he very wisely thought it better not to risk his new machine, let alone his own neck, in trying to land there. However, he was able to get away next day, and made a very good flight. Mr. Slack will be accompanied on his tour by an Austin car, which is being fitted with spare parts for the machine and motors, and all necessary tools for repairs. All will wish him a very successful trip.

On Sunday the wind was too high until about 6.30 p.m. for much flying to be done. Mr. Lewis Turner made a couple of circuits just after 4.30, followed by Mr. Noel on the Grahame-White school Farman, who also went twice round the course, touching ground several times during the flight. After that nothing happened until 6.30, when M. Pierre Verrier took a passenger up on the Maurice Farman biplane. From that time until dusk he was occupied in giving flights to passenger after passenger in his usual excellent manner. Soon after M. Verrier's appearance, Mr. Turner again went out, only to be brought down in front of the private enclosure through the breaking of a connecting rod in his Gnôme.

A little after seven o'clock Mr. Slack, on the I.C.S. Blériot, left for Bedford at high speed, assisted by a following wind. From this time until it became too dark there was a constant succession of machines. Mr. Lewis Turner, Mr. Noel, and Mr. Travers in turn on the Grahame-White Farman, Mr. Weir on the Blériot, Mr. Sabelli on the Deperdussin, and, as above mentioned, M. Verrier on the Maurice Farman. A small crowd had remained to watch, and made up in enthusiasm for the paucity in numbers.

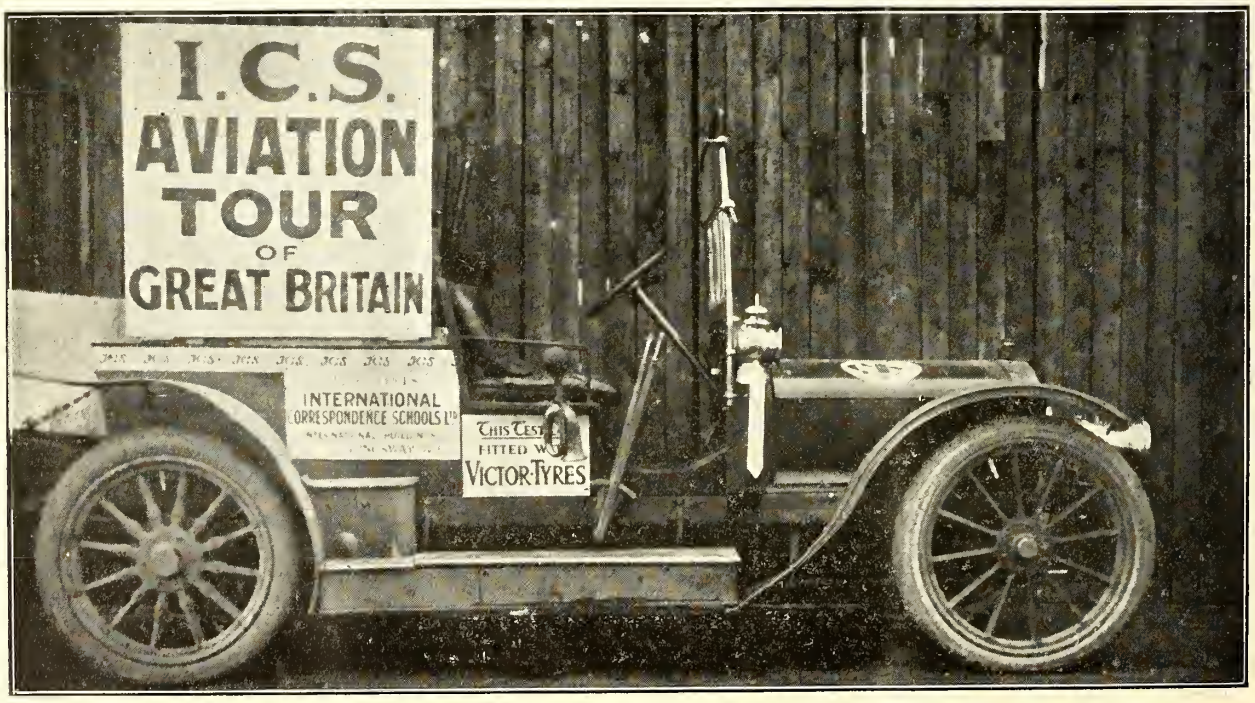
The Second Summer Meeting at Hendon.

Next Saturday, the 22nd, all being well, there will be some excellent flying at the London Aerodrome. The proceedings will open with the usual cross-country handicap, and afterwards the Earl of Lonsdale will present the Gold Cup for the Aerial Derby and the other prizes for the day to the successful competitors. There will also be a Speed Handicap round the pylons.

Before long there should be many fresh competitors at Hendon. It is said that the Bréguet Company have taken several sheds, and that one of the best British pilots will be the crack flier for the firm. Also it is reported that the Bristol firm have taken sheds for several machines. Mr. Hucks will have Mr. Barlow's new Blériot. The Aircraft Company will soon have some new Farmans over, and Mr. Grahame-White is bringing some new French machines over as well as producing new machines from his own works. The Caudrons and Blériots will also be at work in full force, and altogether there is a busy time ahead.

An Opportunity for Pilots.

The Editor of The Aeroplane knows of one or two openings for first class pilots to fly machines in the Military Competitions in August, and would be glad to hear from any certificated aviators who would be willing to offer their services. He would particularly point out that neither he nor the constructors of the machines which he has in view wish to be bothered by offers from pilots who are not of proved ability, from pilots who are not willing to fly according to instructions and without playing tricks. This is a genuine opportunity for serious aviators, and no others need apply.



Doing the Thing Well.—The International Correspondence Sch ools' Austin Car which is acting as tender to Mr. Slack.

The Grand Prix of the Aero Club de France.

The Grand Prix of the Aero Club de France was a two days' race over a triangular course in the old province of Anjou, the turning points being the towns of Cholet, Saumur and Angers. Three circuits had to be made on Sunday, June 16th, and four on the following day. The total distance to be covered in the two days was about 1,100 kilometres. The prizes were as follows: 1st, 50,000 francs; 2nd, 20,000; 3rd, 15,000 francs; 4th, 10,000 francs; and 5th, 5,000 francs. The race was open to all types of aeroplanes. A reduction of one-sixth of the time taken in the circuits was to be made for each passenger carried, a very favourable handicap for the big multiseater. The entrants were as follow:—

Single-Seaters.

1. Deperdussin m., 80-h.p. Gnôme—J. Vedrines.
2. Morane m., 50-h.p. Gnôme—Tabuteau.
3. Bleriot m., 50-h.p. Gnôme—Garros.
4. Morane m., 50-h.p. Gnôme—Bedel.
5. Nieuport m., 80-h.p. Gnôme—Helen.
6. R.E.P., 80-h.p. Gnôme—H. J. D. Astley.
7. Deperdussin, 80-h.p. Gnôme—Vidart.
8. Morane, 50-h.p. Gnôme—Bobba.

Two-Seaters.

1. R.E.P. m., 80-h.p. Gnôme—Molla.
2. Morane m., 80-h.p. Gnôme—Brindejonc des Moulinais.
3. Morane m., 80-h.p. Gnôme—Le Lareinty-Tholazan.
4. Hanriot m., 50-h.p. Gnôme—Frey.
5. Zens m., 80-h.p. Gnôme—Legagneux.
6. Borel m., 70-h.p. Gnôme—Ehrmann.
7. Zodiac b., 70-h.p. Gnôme—Debroutelle.
8. Ladougne m., 80-h.p. Anzani—Divetain.
9. Blériot m., 70-h.p. Gnôme—Hamel.
10. Blériot m., 70-h.p. Gnôme—Perreyron.

Three-Seaters.

1. R.E.P. m., 100-h.p. R.E.P.—Amerigo.
2. Hanriot m., 80-h.p. Gnôme—Bielovucic.

Four-Seaters.

1. Maurice Farman b., 90-h.p. Renault—Renaux.
2. Nieuport m., 80-h.p. Gnôme—Gobé.
3. Nieuport m., 80-h.p. Gnôme—Espanet.
4. Maurice Farman b., 70-h.p. Renault—Fourny
5. Deperdussin m., 80-h.p. Gnôme—Prévost.
6. H. Farman b., 80-h.p. Gnôme—Fischer
7. Deperdussin m., 80-h.p. Gnôme—Busson.

Five-Seaters.

1. Bréguet b., 100-h.p. Renault—Moineau.
2. Bréguet b., 110-h.p. Salmson (Canton-Unné)—Debussy.
3. Astra b., 90-h.p. Renault—Labouret.
4. Astra b, 90-h.p. Renault—Gaubert
5. Caudron, 100-h.p. Anzani—Allard.

The following notes, written before the race, have been received from Mr. Sassoon, who was Mr. Hamel's passenger:—

"Angers is crowded to overflowing, and it was only with great difficulty and the good offices of M. Blériot that your correspondent was able to get a bed at all. Our two representatives, Hamel and Astley, are in the best of spirits and confident of putting up a good show. The latter has followed in Gordon Bell's footsteps, and so impressed Esnault Pelterie with his skill, that Granel has had to stand down altogether, and Amerigo was allotted to the R.E.P. 3-seater, which he does not care to fly. Astley is full of eulogies for his mount, a single-seater R.E.P. with an 80-h.p. Gnôme, which he reports is very quick on the controls, a beautiful glider and wonderfully steady machine, though she does 132 kilometres an hour.

"Hamel went round the course to-day on a standard 50-h.p. Gnôme single-seater in a wind that kept all the other machines on the ground, and ended up with a spiral *vol plané* that both Blériot and Leblanc characterised as the finest they had seen.

"The tendency of the fast monoplanes entered for the race is towards the low Nieuport type with a very short fuselage and disc wheels. The Nieuport has a cowl covering the top half of the engine, whilst Vidart's Deperdussin has a shield on the propeller entirely covering the engine. The Deperdussins generally are probably the fastest machines of their various types in the race.

"The Morane-Saulniers are of the same type as exhibited at the last Paris show, and look very weather beaten. Blériot has entered a two-seater like the one piloted by Hamel in the Aerial Derby, with a 70-h.p Gnôme; a second one, with a covered fuselage, which will be flown by Perreyron, a standard 50-h.p. Gnôme single-seater with Garros at the helm. M. Blériot's idea is that only five machines will complete the course, and that the old lower-powered, well-tried engines alone will succeed.

"Hélén's original Nieuport is estimated to do 189 kilometres an hour, but there is a doubt if he will fly it, as the landing grounds are very small. The Hanriots shape well, the 3-seater being especially steady; the single-seater, however, looks very unstable fore and aft.

"Among the biplanes, the Maurice Farman, which was disqualified for its late arrival, is probably the best. The Henry Farman seems fast though less steady. The Bréguet five-seater, with a 14-cylinder 100-h.p. Renault, and a four-bladed propeller, was flying well, but the 5-seater Caudron, with a 100-h.p. 14-cylinder Anzani, appeared to be the slowest machine of all.

"The Astra have entered a large Wright biplane, and a tractor one of the show type that leaves much to be desired in lateral stability. Both these are 3-seaters. Sommer has withdrawn his entries owing to Kimmerling's death, and the other entrants were not out.

"From what is said on all sides, there are practically no landing places between the controls, as the country is cut up into small fields covered with growing crops, or bushes, or else thickly wooded, so that any engine trouble would put a competitor out of the running. As the atmosphere is full of nasty remous, the task set is by no means easy, and it seems unlikely that the big multi-seaters will come through with much success, notwithstanding the favourable handicap that they enjoy under the rules.—E. V. S."

Sunday, the first day of the race, was windy enough to annoy even the most placid of Stormy Petrels. So inclement was the weather that MM. Esnault-Pelterie, Bréguet and Deperdussin agreed not to permit their respective pilots to start. Garros rose at 9 o'clock, Bedel a few seconds later, and Legagueux with his faithful companion, Martinet, left at 9.15. At 9.46 a.m. Espanet left with a passenger, followed at 9.50 by Hélén, also on a Nieuport. Six minutes later Hamel, with Mr. E. V. Sassoon as passenger, left the aerodrome.

Legagueux made a forced landing and smashed his machine between Pin-en-Monges and Baupréau, some miles short of Cholet. Hélén also broke down at Doué-la-Fontaine towards the end of the second stage. Hamel, after completing the first circuit in 1 hr. 59 m. 55 s., retired owing to fatigue and air sickness at Cholet on the second round. Espanet, who took 1 hr. 45 m. 40 s. for his first circuit, also retired at Cholet owing to engine trouble. Garros successfully completed the three circuits, and was thus alone qualified for Monday's race. Brindejonc des Moulinais, after a magnificent flight, was unfortunate to arrive at Angers four minutes after the official close of the first day's racing.

On Monday Garros continued his victorious course and finished his last circuit late in the afternoon. He thus wins the Grand Prix of 50,000 francs and the speed prize of 20,000 francs. In addition to this, he was classed fourth in a special competition held during the day for those who did not start the previous day and those who were eliminated by accident. A consolation prize of 50,000 francs was offered for the fastest journey over three circuits. There were sixteen starters, nine of whom took passengers. Dr. Espanet was the winner. Allard, who had three passengers with him in his Caudron biplane, fell from a height of about 100 ft. One of his passengers had a leg badly broken. The others escaped with severe bruises.

It is reported that Bedel smashed two machines in the day, Bielovucic fell into the Loire, but escaped with a broken leg, and several other accidents occurred, as it was still blowing a gale, but accurate details are lacking at the moment of going to press.

Mr. McClean's Experiments.

Mr. F. K. McClean flew from Eastchurch to Eastbourne on Monday on his 70-h.p. Short tractor biplane, taking with him his chief mechanic as passenger, the journey being the longest he has yet made direct across country. On the way he flew over his home at Tonbridge, "to wake up the establishment." His intention is to do a number of flights over the wreck of the s.s. *Oceana*, with a view to testing the maximum depth to which it is possible to take photographs through water. He is being assisted by some of the cleverest Press photographers on the staff of one of the big illustrated papers.

The Week's Work.

Monday, June 10th.

Brooklands.—At Bristol School, 4.45 a.m., Mr. Hotchkiss with Lieut. Hope three circuits, passenger in control. Capt. Agnew four straights, improving quickly. Lieut. Bulkely solus ¼ hour making three turns to right and four to left at about 200 ft. Mr. Hotchkiss with Lieut. Hope three circuits. Lieut. Anderson rolling and long hops, afterwards flying two straights very well. Capt. Agnew four more straights. Mr. Hotchkiss up with Lieut. Wilmer, who is handling machine quite well. In evening, Mr. Kemp first out to test weather. Then up with Lieut. Wilmer. Capt. Agnew four straights. Mr. Kemp up again with Lieut. Wilmer giving him landing practice and three circuits. Mr. Bettington out doing short straights on Anzani monoplane. Capt. Agnew solus again for two more straights.

At Sopwith School, early, Capts. Alston and Howell and Messrs. Webb-Bowen, Hedley and Powell out on school Farman, all straight flights solus.

In evening, Messrs. Herbert, Alston, Webb-Bowen and Howell again out.

At Vickers School, in evening, Capt. Darbyshire made a number of straights on No. 2.

Eastchurch.—No flying before evening, when Capt. Dunne took out Dunne monoplane for little exercise, doing several figures of eight at approximately 250 ft., and landing in quite approved style. He then had the biplane out and gave Mr. Johnstone a few practice straights. The Hon. Maurice Egerton out on his triple-twin Short machine, making circuit of island. Mr. McClean out on 70-h.p. tractor. Mr. Alec Ogilvie out on N.E.C.-Wright machine with Mr. Fowler as passenger, putting in flight of 65 mins

Hendon.—At Grahame White School, no flying in morning. In evening Capts. Salmond and Nicolas, and Messrs. Fuller, Hoelscher and Scully doing straights with M. Noel; Baroness Schenck up for a passenger flight, and Mr. Kershaw doing circuits (all on school 'bus).

At Blériot School, in evening Mr. Hall took rolling machine out and did two straights. Meanwhile Mr. Hamel and Mr. Weir went off on their 50-h.p. single-seaters to Ranelagh at 8 p.m., latter returning at 8.30 p.m., having experienced no difficulty in finding his way in spite of the gathering dusk and evening mist.

Ranelagh.—Mr. Gustav Hamel arrived on Blériot single-seater preparatory to next day's performance.

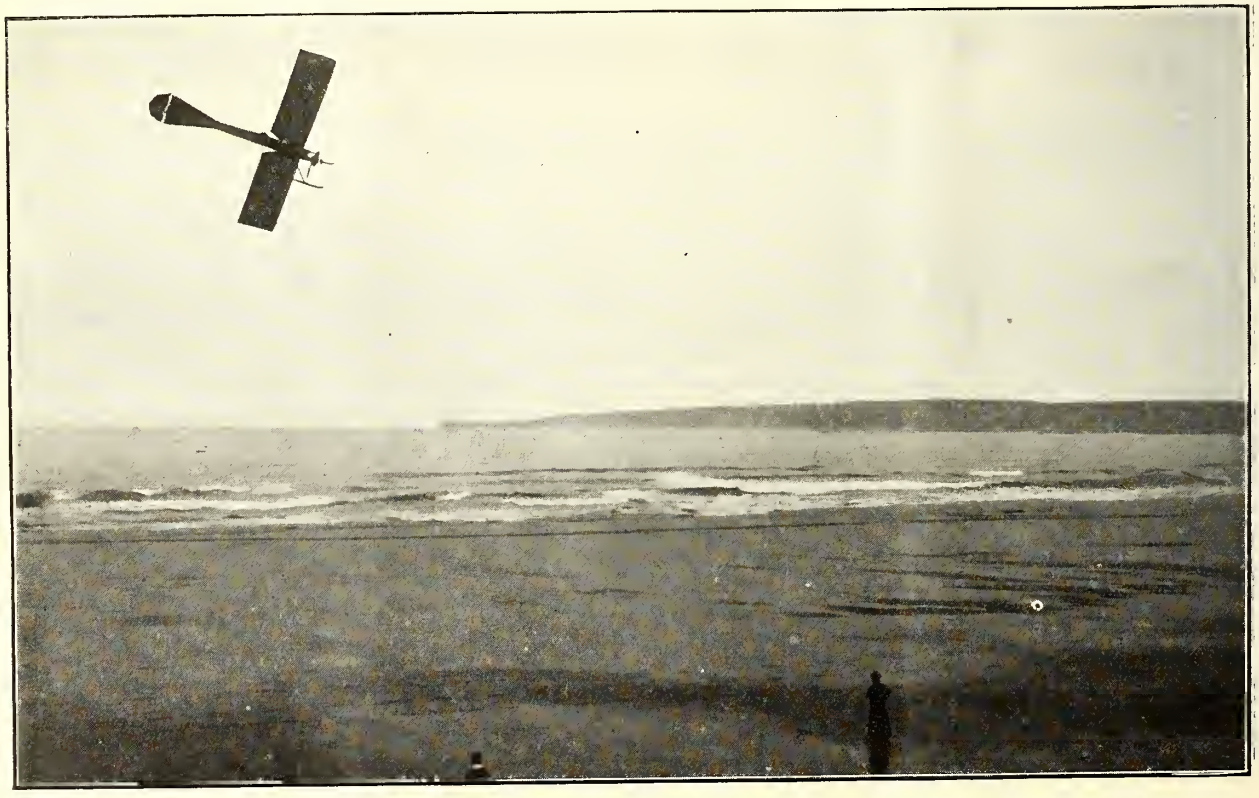
The Plain (R.F.C.).—In morning Capt. Loraine out on Deperdussin for quarter hour to test engine. Second flight was with passenger, Lord Henry Seymour. This flight lasted for an hour, covering 55 miles and at height of 1,000 ft. Machine has had new wings fitted, which gives it more speed, as they are of racing type. Corporal Ridd out on *F.7.*, for 20 mins., and Lieut. Porter for 20 mins. Staff-Sergt. Wilson then took machine out for 15 mins. In evening Lieut. Barrington-Kennett came over from Farnborough per Nieuport. Strong breeze; made journey in ¾ hour. Distance is 50 miles, and this has been done in 25 min. Lieut. Fox made two good flights on *F.7.* for 40 mins. Capt. Allen took Bristol monoplane out for a long flight, reaching 800 ft., flying splendidly.

The Plain (Bristol School).—No flying in morning. Later Mr. Pizey trial with Lieut. Christy as passenger. Later Mr. Pizey on monoplane with Mr. Lindsay Campbell as passenger, for 20 minutes. Mr. Jullerot on two-seater monoplane giving tuition to Lieut. Christy. Mr. Bendall with pupil on biplane *No. 55*. Capt. Allen at about 2,000 ft. and staying up half an hour on monoplane, and made very good landing. Lieut. Fielding four good straights on monoplane. Mr. Lindsay Campbell rolling on monoplane. Lieut. Pickles on biplane *No. 66a*. Mr. Lister on same. Mr. Rawson Shaw flying 10 minutes. Mr. Prendergast on biplane banking steeply and landing neatly.

Waterloo (Liverpool).—Messrs. Birch and Hardman out on school machine. Mr. Hardman straights near ground, flying about mile and a half each time. Mr. Birch also straights and turn, but conditions after storm made flying anything but easy. Mr. Melly then out on two-seater and took Mr. R. C. Jones and his niece, Miss Clare Melly, for circular flights round half-mile land mark, weather not being fit for inland flying.

Tuesday, June 11th.

Brooklands.—At Bristol School, Mr. Hotchkiss at 4.45 a.m. took up Mr. Holyoake two circuits. Then Capt. Agnew straights up to 50 ft. or so, making good landings. Mr. Hotchkiss out again with Mr. Holyoake, who took control from pilot's seat. Then with Lieut. Wilmer in pilot's seat, improving quickly.



Mr. Brereton banking on the Isaacson-Blackburn at Filey. As may be seen, the photograph is taken from some height above the beach, so that it gives a true idea of the angle of banking.

At Sopwith School, early, Capts. Alston and Howell and Messrs. Hedley, Powell and Herbert in charge of school Farman solus for straights.

At Deperdussin School, Capt. Dawes and Mr. Bellairs on brevêt machine and taxi, rolling. Windy evening, no flying.

Eastchurch.—No flying. High Wind. Rain in the evening.

Hendon.—At Grahame-White School, in morning Capts. Salmond and Nicolas, Mr. Fuller and Baroness Schenck out for straights with M. Noel; Mr. Kershaw doing circuits. Evening too wet for flying.

At Blériot School, in afternoon Mr. Hamel, with Capt. Mark Kerr, R.N., as passenger, on 70-h.p. tandem Blériot two-seater, flew over to Ranelagh to give an exhibition before their Majesties the King and Queen. Wind blowing about 25-30 miles per hour.

Newquay.—Mr. Salmet arrived from Barnstaple, having made fine flight along the coast on Blériot.

Ranelagh.—Mr. Gustav Hamel, with Capt. Mark Kerr, R.N., as passenger, arrived from Hendon *via* Ealing and along the Thames. Arrival took place while the King and Queen were present, and Mr. Hamel was duly presented. Thereafter he made a number of pretty exhibition flights on the single-seater.

The Plain (R.F.C.).—Corpl. Ridd out on *F.7.* in morning for ¾ hour, reaching 1,500 ft. This N.C.O. is splendid flier and it is hoped will make good monoplane flier. Lieut. Porter then took over *F.7.* for ½ hour, after which Lieut. Fox took over the machine. Lieut. Barrington-Kennett out on Nieuport with passenger, Capt. Loraine, for ½ hour. Capt. Loraine then took Nieuport over for 1 hour, doing rolling. Capt. Allen out on Bristol monoplane for 20 mins. Lieut. Barrington-Kennett left here in morning for Farnborough to fly over again with another Nieuport of 50-h.p. Five Nieuports are expected on the Plain, two of 100-h.p., one of 50-h.p., and two of 70-h.p. Flying continued for three hours in morning.

The Plain (Bristol School).—Mr. Pizey with Lieut. Christy first up for 10 minutes on two-seater monoplane. Mr. Smith-Barry at same time on single-seater mono. Capt. Allen on two-seater monoplane. Mr. Bendall giving tuition to Messrs. England and Featherstone. Solos by Mr. Lister (one very good figure of eight), Mr. Prendergast (round Fargo, reaching 400 ft.), Dr. Cordner (about 10 minutes, landing well). Mr. Busteed trial about midday, but found weather bad. Mr. Jullerot testing late afternoon, whilst Mr. Bendall took Lieut. Hallahan (new pupil) for first flight. Mr. Busteed giving tuition Mr. England.

Windermere.—Lakes Flying Co.'s biplane out passenger carrying.

Wednesday, June 12th.

Brooklands.—At Bristol School, 7.30 p.m., Mr. Hotchkiss up with Capt. Macdonell (new pupil). Then Capt. Agnew doing straights. Then Mr. Holyoake straights with Mr. Hotchkiss in passenger seat, but not touching control. Capt. Agnew again flying two straights and one circuit. Mr. Hotchkiss up again with Capt. Macdonell, finishing with a spiral *vol plané* to front of sheds. Morning too windy for flying.

At Sopwith School, evening, Mr. Raynham out solus on school Farman, then Mr. Hedley one turn solus, followed by Messrs. Powell, Herbert and Webb-Bowen straights. Mr. Sopwith also out on Farman with a lady passenger.

At Vickers School, evening, Capt. Darbyshire out with No. 2.

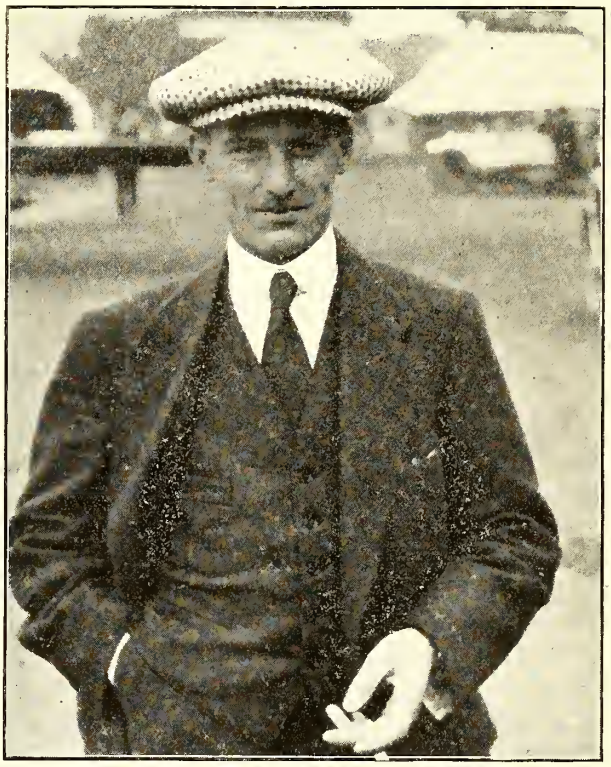
At Deperdussin School, evening, Mr. Bellairs out on taxi.

Eastchurch.—Still continued wind and rain.

The Plain (R.F.C.).—Work confined to hangars in morning. Capt. Loraine out on Deperdussin in evening. First flight, with Capt. Brooke-Popham, the O.C. Military Wing here, as passenger. Second flight, Major of the Royal Field Artillery as passenger. Third flight, Capt. Langborn Popham, of R.F.A., as passenger. Lieut. Porter, Cpl. Ridd and Sergt. Wilson out on *F.7.*, first-named reaching 1,300 ft. Lieut. Fox out on *F.7.* with Sapper McCadden as passenger. During afternoon, Lieut. Fox out on *F.7.* observing artillery fire. This proved very useful. Lieut. Fox was flying for one hour on this trip. Lieut. Conner was rolling on the Nieuport for 20 mins.

Hendon.—Half a gale. Nothing doing.

The Plain (Bristol School).—Mr. Pizey in afternoon giving first trip to Mr. Greig (new pupil), Mr. Kemp taking Mr. England for tuition. Mr. Smith-Barry with Lieut. Wall, and Mr. Kemp with Mr. Featherstone. Mr. Pizey solus on single-seater monoplane. Capt. Allen on mono., landing well. Major Boyd Moss for 10 minutes, as also Mr. Prendergast. Dr. Cordner, landing rather heavily near Fargo, slightly damaged machine. Mr. Busteed tuition to Mr. England, who afterwards went up with his brother, Mr. Gordon England. Mr. Busteed testing new monoplane just received from works, quickly rising to 1,000 ft. and landing with complete spiral *vol plané*.



M. Pierre Verrier, who is flying so well at Hendon.

Waterloo (Liverpool).—Mr. Hardman did two splendid straights of 1½ miles each in strong westerly wind. Then Mr. Birch out, and in circling pylon turned inwards. With at least 15-mile wind behind him, he failed to complete turn before sandhills were reached, and preferring latter to row of cottages some 200 yards ahead, he effected somewhat abrupt landing against sandhill which only had effect of carrying away bottom chassis board, breaking propeller and one wing. Local Press made a great flutter about "narrow escapes" and "overturned machines," but were quietly persuaded to contradict them afterwards.

Windermere.—Biplane out passenger carrying, flying very strong.

Thursday, June 13th.

Brooklands.—At Bristol School, Mr. Hotchkiss out 5 a.m. with Capt. Macdonell for three circuits, latter handling control. Capt. Agnew then out solus. Mr. Holyoake also flying straights with Mr. Hotchkiss up behind. Lieut. Anderson flying straights. Capt. Agnew out again flying quite well. Lieut. Anderson then second solo doing straights. Mr. Hotchkiss last up with Capt. Macdonell for two circuits. Windy evening, no flying.

At Sopwith School, early, Mr. Hedley made two excellent circuits on school Farman, followed by Mr. Powell, who made a turn. Messrs. Herbert and Webb-Bowen also out making straights.

At Vickers School, Mr. Macdonald out in nasty wind about 10 a.m. on No. 5.

Eastchurch.—No flying. Wind and rain.

Hendon.—At Grahame-White School, in morning, majority of pupils suffering from that tired feeling, effects of military discipline evident, as only ones out were Capts. Salmond and Nicolas, who were up for straights with M. Noel in passenger seat. About 6 o'clock Mr. Travers, late of Eastchurch, made a very fine flight on *F.5.*, which now has very little lift on the tail, and pilot's seat 1 ft. 6 in. in front of the plane, making machine very good to fly. Evening again hopeless.

At Blériot School, about 6 a.m. Mr. Clappen put in four straights on rolling machine.

The Plain (R.F.C.).—In morning Capt. Hamilton flying Deperdussin for ½ hour. Corpl. Ridd out on *F.7.*, but after flying for a little time he had to come down owing to engine trouble. Lieut. Conner out on Nieuport rolling for 20 mins. and landed about five miles from camp and had to remain there until evening owing to wind getting up. Lieut. Fox motored over to machine to see if the engine was in good order for running, and then had pluck and nerve to fly machine over to

sheds in terrific wind. The machine rocked and tossed shockingly, and great credit is due to Lieut. Fox for his daring. Height about 300 ft. Could not have landed on any account as he was, so had to turn round and face wind and then gradually come down. When he was travelling with the wind his speed was well over 90 miles an hour.

The Plain (Bristol School).—Mr. Kemp first giving tuition flights to Messrs. Greig, England and Barnwell. Mr. Prendergast on biplane. Mr. Busteed with Mr. Bendall as passenger testing new monoplane. Wind very high, but machine behaved well and quickly attained a good altitude, which was maintained throughout, eventually landing with engine stopped.

Windermere.—One exhibition flight in strong wind.

Friday, June 14th.

Brooklands.—At Bristol School, 4 a.m., while everyone belonging to other sheds were slumbering, Mr. Hotchkiss got out for solo, then got Mr. Holyoake up in pilot's seat and flew some straight lines. Capt. Agnew then solus for three circuits, not at all happy through being bumped about. Mr. Hotchkiss then went up solus to see what weather conditions were and found it much too bad for further work. Nothing doing in evening.

At Hanriot School, very early, Mr. Sippe out testing engine on new Hanriot, making a straight flight. Windy evening, no flying.

Eastchurch.—Mr. Johnstone did a few taxi runs on Dunne biplane before breakfast. On returning to breakfast he met with a very bad motor-cycle accident which caused his death before night. His loss is severely felt by all at Eastchurch, where he was already most popular.

Commander Samson flew from Harwich to Burntwick Island on S.41.

Falmouth.—Salmet arrived between 7.30 and 8 p.m., flying splendidly in quite nasty wind. Came right over harbour at 1,200 to 1,500 ft., landing at Penryn. He had a very uncomfortable journey, and was not at all sorry when he laid him down to rest at Falmouth Hotel.

Hendon.—At Grahame-White School, busy time in morning. Baroness Schenck, Capts. Salmond and Nicolas and Commander Yeats-Brown, Messrs. Fuller and Hoelscher getting two lessons each. Capt. Salmond now doing straights solus. Yet another hopeless evening.

At Blériot School, M. Gaudillon rolling about 6 a.m., but wind too strong for useful work and machine was returned to hangar. Mr. Slack then had his 50-h.p. single-seater out in which he is doing a "Circuit of Britain" under the auspices of the International Correspondence Schools, and flew for about 10 minutes at about 300 ft., expressing himself very pleased with machine, this being first time he had flown machine fitted with 50-h.p. motor, on this side of the Channel.

The Plain (R.F.C.).—In morning Capt. Brooke-Popham out on *F.7.*, reaching 500 ft. Lieuts. Fox and Porter both reached 1,000 ft. Capt. Loraine rolling on Nieuport for ¼ hour. In evening Capt. Loraine out testing the 70-h.p. Blériot and new propeller. Lieut. Fox on *F.7.* for 20 mins. in awful weather.

The Plain (Bristol School).—Little flying possible; useful work done in hangars.

Saturday, June 15th.

Brooklands.—No flying. Gales and rain.

Eastchurch.—No flying. Etrich machine for Admiralty on way from Folkstone via road, objects to coming under small railway bridge, and up to time of writing has not yet arrived.

Hendon.—At Grahame-White School, deceptive morning, as wind rose directly fog went. Only work was some straights by Capt. Salmond. In afternoon wind too hopeless even for skilled flyers in race meeting, but some exhibition flights, reported elsewhere.

The Plain (R.F.C.).—Capt. Loraine was out on Blériot testing wing controls, etc., and did two short hops, and then he and Capt. Brooke-Popham both out on *F.7.*, doing excellent flying. Lieut. Fox after took the machine, also doing good flying. *F.8.*, smashed up by Staff-Sergt. Brockbank, now ready for flying.

Sunday, June 16th.

Brooklands.—Nothing doing till evening. Wind 30 m.p.h. and more. About 7.30 p.m. almost flat calm, so Mr. Hotchkiss out to test air, followed by good flight by Mr. Merriam with passenger. Had not been up for two months, but handled machine excellently, did several circuits and figures of eight, and good landing. Flight made for entertainment of Mrs. Turner-Farley, of Falmouth, who is keenly interested in aviation. Later various Bristol pupils out, Capt. Agnew flying good steady circuits.

Mr. Raynham out on Sopwith School biplane, also with pupils, in usual excellent style.

Strange story going the rounds concerning A.B.C. engine in Mr. Sopwith's Burgess-Wright. When returning from winning prizes at Hendon engine developed a knock. Traced to front cylinder, which, when taken off, showed a lump inside and piston had a broken ring. On close examination three distinct hammer marks outside right up under edge of water-jacket, where not likely to be seen. Writer has examined cylinder and can vouch for marks. Has also tested same cylinder, and finds heavy blow is needed to make even less dent, so damage must have been deliberate. May have been done during stop at Hounslow, but it is suggested that loosening of rocker which caused descent there was also deliberate. Either might have caused death of aviator and passenger, so miscreant responsible may expect short shrift if discovered another time. No reproach to Hendon in general intended, as similar thing has happened at Brooklands itself to British engine of another make.

Eastchurch.—Mr. Alec Ogilvie out on N.E.C.-Wright with Mr. Fowler as passenger for 35 mins.; he afterwards took up Mr. Briggs as passenger. Mr. Jezzi out on own biplane taking Messrs. Portway and Griggs as passengers in turn.

Hendon.—Good flying. About 6 p.m. Mr. Weir had 50-h.p. single-seater out for practice spin, going over to Chipping Barnet prior to attempting qualifying flights for superior brevêt, which he intends attempting this week.

The Aerial Derby Appeal.

On Friday last, the stewards of the meeting of which the Aerial Derby formed part met to discuss Mr. Sopwith's appeal against his disqualification for passing inside the mark at the turning point at Purley. A large amount of evidence was forthcoming to prove conclusively that Mr. Sopwith passed outside the mark at a distance of half a mile, flying very low down, and it was also practically proved that the pilot who turned inside the mark was M. Guillaux on the Caudron. However, the stewards rejected the appeal on the ground that Rule 6 insisted that competitors should have their numbers read at the turning points.

They apparently based their decision on several well-known instances in horse racing, where a judge has been obviously mistaken and has not placed the winning horse, although the owners and riders of the horses who were placed were prepared to give evidence that that particular horse won, the argument being that the judge's decision is final, and that in the case of the Aerial Derby the official observer at each point was the judge so far as that portion of the race is concerned.

Unfortunately, the stewards are obviously contradicting themselves on this point, because, in the first place, the rule says that competitors must approach the turning point sufficiently closely to have their numbers read, which is quite another matter. If this rule is interpreted strictly as the stewards read it, then nobody completed the course at all, for at Purley the only numbers taken were those of Mr. Hamel and Mr. Valentine; Mr. Valentine's number was not taken at one or two points, and Mr. Hamel's number was not taken at Epping. Consequently, on the theory of the stewards, nobody completed the course at all.

But, as a matter of fact, at the finish of the race on the 8th, it was more or less agreed that this rule should not be strictly enforced, and that evidence of identification should be sufficient. Mr. Sopwith was disqualified, not because he was identified as having passed inside, but because the observer at that point thought that the machine that passed inside was Mr. Sopwith's, and could not think of any other machine it might have been.

Rule 6 having been wiped out by the officials themselves, and Mr. Sopwith having proved conclusively that he did go round the course, the only grounds on which he can now be disqualified seems to be that the observer did not see him, though it is fairly clear that the observer was so busy watching M. Guillaux passing on the inside that he could not possibly see Mr. Sopwith passing at almost exactly the same moment on the outside. Anyone will admit that it is exceedingly unjust to disqualify a man because the organisers of the competition did not make proper arrangements to have an adequate supply of observers, for no observer can see two different machines at once if one is in front of him and one behind him. The case will now go before the stewards of the Royal Aero Club, and it is to be hoped that, although the majority of them are primarily gentlemen intimately connected with horse racing, they will realise that aviation is a new sport necessitating new conditions, and will treat the matter from a common sense point of view, and not on hard and fast rules, especially in view of the fact that the disqualification itself was not made according to any rule at all.

There is no doubt that Mr. Sopwith covered the course, and, therefore, there is no doubt that he was actually the winner of the Aerial Derby.

Correspondence.

The Editor of The Aeroplane *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* The Aeroplane, 166, *Piccadilly, W.*

Gulls as Instructors.

Sir,—I read with great interest a letter in The Aeroplane for March 28th, headed "Lessons from Gulls." Later on I had an opportunity of watching these nearly perfect birds myself, and was much struck with their capabilities and the perseverance with which they trained themselves in the art of both trick and straightforward flying. Each gull appears to spend the best part of his day in practising various methods of flying, which, if mastered, prove such thorough protection against stormy weather or anything else that likes to come along.

It is good to watch him as an experimenter, flying again and again through a nest of cliff currents, trying every angle and every speed until he has satisfied himself as to the best way of coping with them. But it is better still to catch him in his duties as instructor, when he is imparting his lore to younger birds. There is a fine old flying school of this sort on the cliffs near the Tilly Whim caves, Swanage. The instructors, two or three fine old gulls; the pupils, jackdaws innumerable.

On one occasion when I was watching, instructors and pupils were having a busy time of it, teaching and learning as hard as they could go. I noticed that the pupils appeared to be divided into classes—one for beginners, another for more advanced pupils, yet one more for some young swells who were specialising in some form of trick-flying too intricate for my brain to grasp. As it is always fun to watch beginners, I turned my attention to that class, and was an interested spectator of the following little episode.

The instructor rose from his perch on a pinnacle of the cliff and curved gracefully inland, rising to a height of some sixty feet from the cliff face. Then, turning, he did a slow glide into the rising cliff current and came back to his pinnacle. Three times he did this, his beautifully flexible wings showing to the best advantage in his quick turns and steep gliding angle; then he signed to the row of attentive jackdaws to begin their part, and settled himself comfortably to watch.

The jackdaws, five in number, rose with a good deal of chattering and fuss, bounced up to the required height, did a frightfully clumsy turn, spent a few seconds in regaining breath and balance, and, with an absurdly exaggerated dihedral angle, began their glide. Numbers one, two, and three rolled along and did fairly well, returning to their starting place in a state of self-satisfied glory. Numbers four and five? you say. Alas! they met with disaster in the shape of an air-pocket. Piercing yells and a dead drop of a hundred feet or so told the awful tale. The old gull, who, I am convinced, was fully conscious of the whereabouts of that pocket, wheeled up into the air and laughed the scornful laugh of a gull who has had the best of it, not in the least troubled with the fact that he had lost five more or less promising pupils, with maybe a premium thrown in here and there.

This over-fondness for a practical joke has been the undoing of a gull many a time, as anyone will know who takes any interest in him. He is a grand old chap, nevertheless, and deserves a place of honour in the ranks of the heroes of the aviation world. (Miss) M. Sutton.

Sudbury, May 22nd, 1912.

Racing Round Pylons.

Sir,—Without wishing to presume in any way, I ask leave to make a suggestion.

It is most *necessary* that the pilot realise his maximum safe banking angle, and it should be, in the interests of aviation, *compulsory* that he should not exceed that angle.

For the sake of argument, let us suppose that an angle of, say, 30 degrees be mutually settled upon, and all competitors keep precisely to it, handicapping could then be allotted with about the same amount of accuracy as is for motor racing, and would do away with the possibility of pilots risking dangerous angles in order to save their time.

But then, of course, some machines could stand a greater amount of banking than others, so that, when a pilot is given a handicap, he should also be given a maximum banking angle, which should either be agreed upon by the constructor, or settled upon by the Royal Aero Club, unless some sort of a rating could be devised.

In this case, handicaps could also be allotted with accuracy.

In the cases in question it will be absolutely necessary for pilots to carry clinometers fitted with some sort of registering needle to assure one that the limiting angle had not been exceeded, in which case disqualification must necessarily follow. It would prevent pilots swinging round pylons, but it would not prevent them approaching the same too closely. It would cause a deal of trouble, but would save many valuable lives.

There is, however, one drawback, and that is in regard to the accuracy of the instruments; but, then, a clinometer is a fairly simple device, and should not cause *very* much trouble in inspection. G. Alan Hill Reid.

Bexhill-on-Sea.

Aeroplane Competitions.

Sir,—I was interested in your remarks about competitions in The Aeroplane because only a few days ago I was thinking about the same difficulty.

It seems to me that a better (though by no means ideal) race would be one in which the competitors had not to leave the aerodrome until a certain time after the start. The *modus operandi* would be to unfurl a white sheet three minutes after the starting signal had been given, and only then should the machines be allowed to start for their destination.

In this way you would get over the "tree-top cutting" danger, and at the same time put a premium on the machine which was a good climber as well as fast, for it would obviously pay to leave the aerodrome at the greatest height possible (except when there was a head wind).

Also—and this is a great point for aerodromes—you would get some of the spectacular effect of a yacht-race start; for, as the machines could be widely separated at the start, a number of them could be got away at the same time. They would leave the ground at different heights, so there would be very little danger of their fouling.

Wishing The Aeroplane the success it deserves.

Worsley. P. B. M.

Flexible Dope.

Sir,—Berthon flexible paint, or varnish, is a flexible compound composed, among other things, of paint, oil, soap, terebine, and rubber, and its principal advantages are as follow:—(1) Waterproof, (2) flexibility, (3) climate proof, (4) rat and white ant proof, (5) durability.

As regards the first of these, it is used *exclusively* in waterproofing Berthon canvas boats.

Secondly and thirdly, it will not crack or peel off in the hottest climate, or in the severest cold. To prove this statement, our boats have been used with great success in the Soudan (with the late Gordon Pasha) and in other tropical parts, and by Sir George Nares and Sir Allen Young in their Arctic expeditions.

Fourthly, several thousand pounds' worth of Berthon boats were stored in Portsmouth Dockyard (which abounds with rats), and, although the vermin bred in the folds of the canvas, in no single instance was any harm done to them. This goes to show that the compound is truly rat proof.

Again, white ants (the most destructive of all insects) will not touch material so painted.

To waterproof canvas, it would take two ounces to the square foot, but glazed cotton or silk would not take one-fifth of this.

It causes shrinkage after use. This, I take it, would be useful, as apparently it is an advantage to ensure every means to prevent wings from sagging. Of course, shrinkage can be avoided by soaking in first instance.

I would like to say it is non-inflammable, but I am afraid this is not the case, as the materials used to ensure perfect flexibility and durability necessitate the use of paint, oil, and other inflammable materials. However, I have tried dropping a lighted vesta on material coated with this paint (while wet and dry), and, no fire having resulted, I take it that it is not dangerously inflammable, but will burn just the same as the woodwork of an aeroplane. Louis Limido.

Leytonstone.

The Royal Flying Corps.

Sir,—I see that the Royal Flying Corps has vacancies for electric bell fitters, etc. Would they consider applications from (A) Piano-tuners, as wire-strain experts; housemaids for polishing brasswork, bioscope operators, and gardeners, also experienced chefs, so that aeroplanes may be fitted with home comforts; (B) infant prodigies, amongst the "men of more than average brain power." How will they measure this last—by volume or weight?

Doncaster. B. Cook.

In Defence of the British Workman.

Sir,—With regard to certain paragraphs in the article on "The Royal Flying Corps" in your paper, your correspondent refers to the British workman as a person unmethodical and generally untrustworthy.

In all probability he has taken one or two of the aerodrome types as examples to work on. If so, I suggest that he is labouring under a delusion, as the general type to be found at those places are persons of semi-leisure, who are in most cases afflicted by what is known as a "taste for mechanics." Moreover, the procedure of serving an apprenticeship in an engineering works and working as an engineer entails too much hard work, which he is anxious to avoid. However, he manages to get into a flying school, and of course wears a costume such as an Arctic explorer would wear. Also he assumes a scientific manner of speech, with plenty of "cahburrettahs," "angles of incidence," and several other mechanical matters of which his knowledge is very doubtful.

As a man who has worked at a trade in various parts of the world, I can assure your correspondent that the men who constructed the British Navy, as well as a few other navies, with the *Olympic, Lusitania,* and many other liners thrown in, are among the best workmen in the world.

To see for himself (and I am sure it would be an education to him), I would recommend him to visit any or all of the following works: Harland and Wolff's, Belfast; The North British Locomotive Co.; or the Clyde Bank Shipbuilding Works, Glasgow; Messrs. Armstrong and Whitworths, Manchester; and when he has looked round I would advise him not to adversely criticise the British workman again.

Referring to his assertion that military discipline would increase the efficiency of the workman, he is very clearly showing that he knows nothing, or practically nothing, of workshop practices.

His concluding observation on the long-suffering workman, in which he states that there are half a dozen people round one man's work, is perfectly correct when applied to aerodrome methods, where there is one man doing the work and half a dozen "experts" giving useless and contradictory orders and advice. It is also true, when applied to the workman in the Royal Engineers, with the much vaunted army discipline in full swing. "Tradesman."

[As one who has worked at the bench alongside the British workman, the editor admits that when one gets him good he is the best man in the world, and in a well-organised factory he can be made highly efficient. But there is much to be said on both sides. Left to himself, the average Englishman is not efficient, and he lacks initiative. The best of all British workmen is probably the self-reliant Scottish engineer, with the Yorkshireman a good second.—Ed.]

Nomenclature.

Sir,—Might I suggest that "aquaeroplane" is more suitable than aquaplane as a name for amphibious flyng machines? Aquaplane may be all right for experimental machines, but surely, when they fly, the air should be represented in the formation of the name. The "Aviary" Rooster.

[Mr. T. W. Peggs, of East Ham, writes making the same suggestion.—Ed.]

[Once more, apologies to those whose letters have been crowded out.]

The First Women's Aviation Meeting.

It is intended to hold a meeting at which the competitors will be women aviators, at the London Aerodrome on Saturday, July 6th. The meeting will be held under the patronage of the Women's Aerial League, and the principal events will be races in which women pilots will compete and a cross-country flight by men pilots who will carry women passengers. An additional prize will be offered to the woman pilot who is the first to carry a woman passenger twice round the aerodrome without alighting. There will be a special tea tent for members of the League and their friends. The Committee, which has been lately reinforced by the Hon. Mrs. Assheton Harbord, the Hon. Lady Shelley, Lady Beerbohm Tree, Mrs. Iltid Nicholl, Mrs. Bruce Williams, and Miss Trehawke Davies, are asking those specially interested in the encouragement of British aviation to offer cup trophies or cash prizes, and everything points to the brilliant success of the meeting. The Hon. Secretary of the League, Denison House, Vauxhall Bridge Road, will be glad to give all information, and to receive and acknowledge through the Press offers of purses, cups or other trophies for the Women's First Aviation Meeting. One naturally hopes that the meeting will be a success, especially in its freedom from accidents, but one confesses to a firm conviction that flying is not a game for women, any more than is motor-car racing, or any other sport calling for nerve and strength combined with judgment. While sympathising in every way with the modern feminist movement, and recognising woman's right to equal treatment politically and legally with mere man, one cannot believe that a woman is physically fit to fly an aeroplane, except under extremely favourable weather conditions, and then only when not under the nervous excitement of competition.

Propeller Successes.

Some remarkably fine performances have been done recently on machines fitted with Bristol propellers of the type so successfully designed by Mr. A. D. Lang. All the successes of Mr. Raynham on Mr. Sopwith's Burgess-Wright with the A.B.C. engine have been performed with the Lang-Bristol propellers, these including the cross-country handicap at Brooklands on Whit Monday, and on the 18th, and the big speed handicap for a handsome silver trophy at Hendon on the day of the Aerial Derby. In all these races it should be noted that Mr. Raynham won his heat as well as the final. In the Aerial Derby itself, both Mr. Moorhouse, on his Radley and Moorhouse monoplane, and Mr. Valentine were using Bristol propellers turned out by the same designer, but of an absolutely different type, thus showing versatility as well as accuracy. Mr. Lang has been devoting himself to the study of propellers for the past three years, having even taken out a patent for a propeller in 1909, so that it is eminently satisfactory that he and the firm which has taken up his designs are reaping their reward.

A Correction.

Owing to an error in transcription the name of Mr. Desmond Arthur, who took his certificate in excellent style on the Bristol military two-seater at Brooklands, was given in The Aeroplane last week as Dennis Arthur. Mr. Arthur is a subaltern in the 5th Battalion of the Royal Munster Fusiliers, and is, therefore, another of the many Irishmen who have become first class pilots. He is a cousin of the late Cecil Grace, and with him made the first passenger flight in Ireland. He is the first pilot to take his certificate on the 50-h.p. Bristol two-seater, and the performance is the more meritorious because it was only his third flight on that machine, all his previous experience having been on the little Anzani-engined Bristol.

Mlle. Marvingt's Scheme.

Mademoiselle Marvingt, who learnt to fly the Antoinette under the tutelage of M. Hubert Latham, and who is now flying a Deperdussin monoplane, desires to present one of the latter to the French nation. To raise funds for this purpose she proposes to deliver lectures in various large towns, beginning at Reims, where she is preparing to take the superior brevêt. The aeroplane thus given is to be named "Capitaine Echemann."

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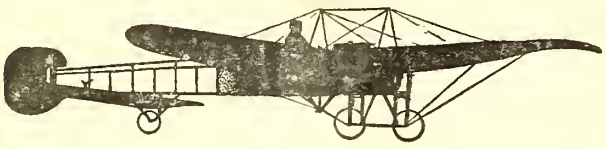

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1d WEEKLY

Edited by CHAS. G. GREY. ("Aero-Amateur")

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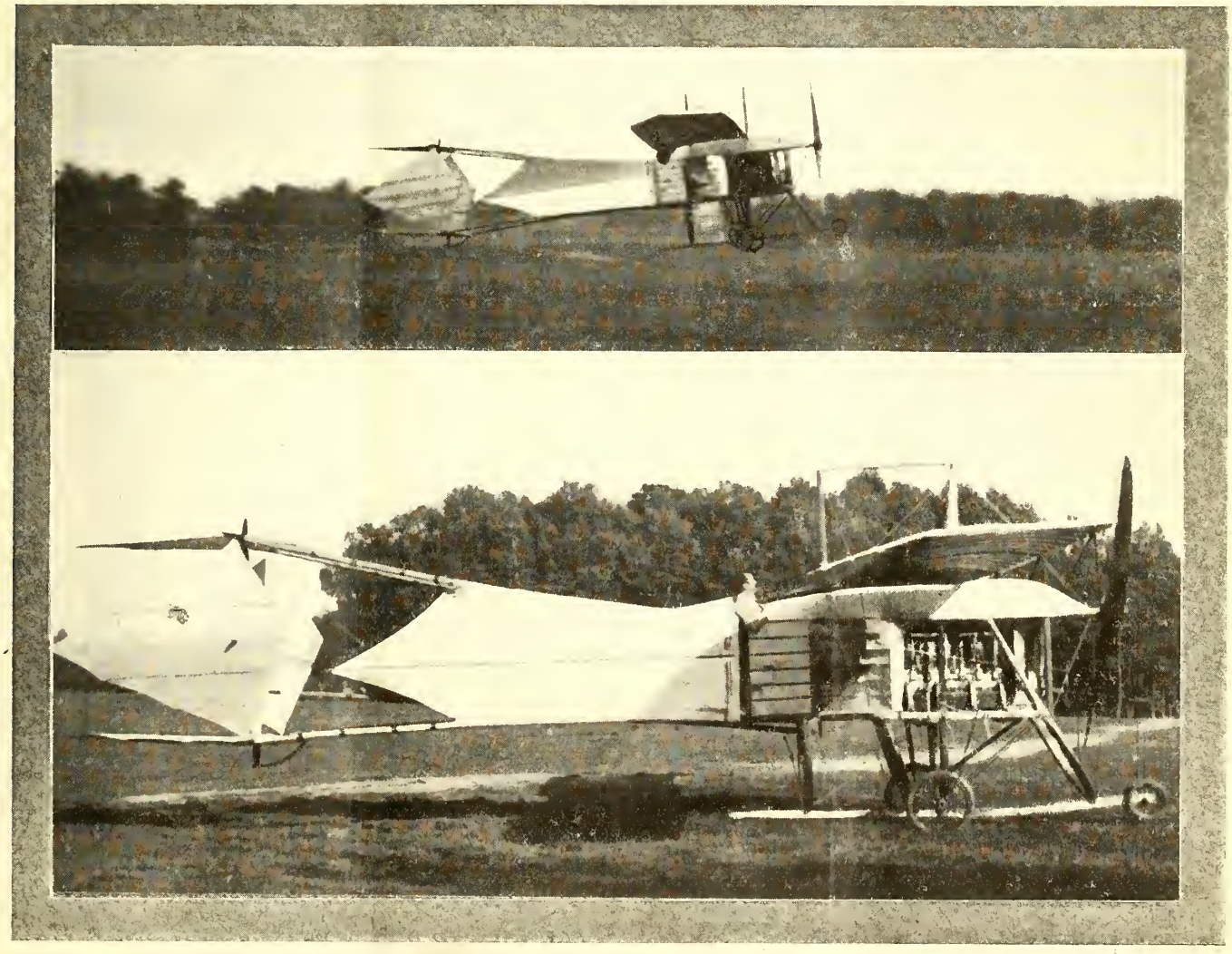
THE BIG DART.



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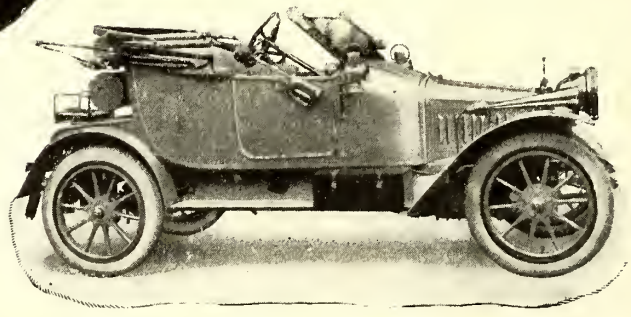

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MATTERS OF MOMENT.

ENGINE POSITION.

Of late sundry conversations and assorted correspondence have impressed on the writer that some people, at any rate, hold quite an erroneous idea of the opinions which have been expressed in The Aeroplane from time to time on the subject of engine position. The general idea seems to be that those of us closely connected with aviation who object to the engine-behind position, hold our opinions because of the fear that in the event of a machine coming down head first the engine may come away from its seat and kill the pilot and passenger. This, however, is quite a wrong idea, for, as was noted in the description of a certain well-known machine in last week's issue, there is not the slightest fear of the engine actually coming away, for in practically all decently constructed machines of to-day the engine seating and the central section generally of the machine remain practically intact. The objections to having the pilot in the front of the machine are quite other than that.

If one takes a pilot and seats him on a ladder in front of the lower plane, so that he is in front of everything else, and all the heavy weights of the machine are behind him, he is not in the least likely to be killed by the engine coming loose, because in a really bad accident he would probably be dead long before the engine reached him, and though it is quite possible that the whole of the centre section, including tanks, engine, seats, and all, may turn over on top of him, it would probably be merely killing a dead man. If, on the other hand, he is pitched out clear of the machine, he stands an excellent chance of smashing himself by simple impact with the ground. One has only to compare the records of the various types of machines to see the truth of these arguments.

During the early part of last year and the latter part of 1910, a tremendous amount of work was done at Brooklands on light, low-powered, but very fast biplanes, with the engine in front and a tractor screw. These machines were shamelessly knocked about, and had altogether an unduly large number of accidents, partly due to the fact that they were very much faster than the ordinary box-kite type of biplane, partly because they were very much quicker on their controls, and, therefore, trickier to handle till they were properly learned, and partly because the pupils were mostly young sportsmen without responsibilities, and themselves had so much confidence in their safety in that type of machine that they really were rather careless. Yet no one was ever seriously hurt.

On the other hand, at practically all the aerodromes in this country there has been accident after accident on the box-kite type in which men have been injured, although the speed of the machines and the force of which they have struck the ground were very much less than those in the other type of machine. One has only to remember the little simple accidents to Captain E. M. Maitland, Mr. H. M. Maitland, Mr. Hubert, Mr. Watkins, Mr. Whittaker, Lieut. Seddon, R.N., Mr. Longcroft, Major Benwell, Mr. Harford and others, to realise that had those aviators been seated in a proper protective body with the big masses of the machine in front of them, to take the brunt of the shock, they would probably not have been hurt at all.

People will argue that if one takes the actual list of fatalities, quite as many men have been killed on monoplanes as have been killed on biplanes. This is quite true, but it merely goes to show that both types of machines need improvement, and, in any case, it is very necessary to remember that in the case of the monoplane accidents, in which comparatively inexperienced pilots have been killed, the speed of the machine has been at least 50 per cent. greater than those in which the biplane pilots have been killed or injured, and that if the speed of the box-kite biplanes had been as great as the speed of the monoplanes, the number of injured in biplane accidents would have been very much less and the number of fatalities would have been very much higher, and that every one of those whose names have been mentioned above would certainly have been killed. To paraphrase Mr. Holt Thomas's seemingly paradoxical remark recently, "if the pilots did not get killed it would be an accident."

At the same time, it is possible to build a machine with the engine behind which is comparatively safe, because being thoroughly well designed and well constructed in every other respect, and having plenty of power, with the engine near the centre of pressure and the weights well massed so that it carries little weight on the tail and is easily controlled, it is, considered as a flying machine pure and simple, as good as anyone can produce with our present-day knowledge.

It is quite possible that for purely military purposes where a certain amount of added risk may be worth taking for the sake of an absolutely clear view in front, such a machine may be worth having. Further, where no risks are taken in the matter of weather or the country over which the machine is flown, it may be worth while having such a machine for aerodrome purposes, because it is certainly cleaner and more

comfortable for passengers if there is no tractor screw in front throwing oil over them.

At the same time, there does not seem any adequate reason why an equally efficient and equally comfortable machine should not be produced embodying the virtues of the engine-behind machine, namely a clear view and absence of propeller draught, and, adding the extra virtue of safety by having the engine and the heavier weights of the machine in front. One need only take one glance at Mr. Ogilvie's transformed Anglo-American biplane to see how it can be done.

THE NEED FOR CONTROL IN AERODROMES.

The recent accident at Douai, when two military pilots on Bréguet machines collided in the air and were killed, suggests that it is really time something was done in this country, as well as abroad, to regulate the flying at the various aerodromes.

At practically all the aerodromes there have been a number of minor accidents which might easily have been fatal but for sheer luck, and might never have been anywhere near accidents if there had been strict rules for conduct on the aerodromes, which could be enforced by a responsible official.

One hears complaints, for example, that certain machines have a trick of swerving to the left, with the result that when they leave their sheds they run down the left-hand side of the aerodrome, so going in the wrong direction of the course and meeting machines which are flying in the opposite direction. In a case like this there are all the makings of an accident similar to that which occurred at Douai, for all that is necessary is that the machine which is rolling shall lift suddenly owing to the inexperience of the pilot, and that the machine coming in the opposite direction shall dip, which is quite likely to happen when the man in charge is a pupil endeavouring to do straight lines without much practice.

Already there have been quite a number of collisions in the air without fatal results. The first on record is probably that in which Thomas, the Antoinette pilot, in descending from a flight, dived on to the top of Captain Dickson's Farman at Milan in 1910, when the latter in the course of an exhibition flight rose suddenly under the Antoinette. In this case Capt. Dickson was very severely injured, but Thomas escaped unhurt. Also, at Etampes, two pupils on Blériots met end-on, fortunately without either of them being hurt at all.

Some of the older hands at Brooklands will remember the extraordinarily narrow escape from a collision between the late E. V. B. Fisher on the old Hanriot, and Capt. Sykes, now commanding the Military Wing of the Royal Flying Corps, on a Bristol biplane, the tip of the Hanriot wing actually overlapping the Bristol when only about 4 ft. above it, both machines being high enough to have killed their pilots if they had touched.

A careless habit which is likely to cause accidents, because it baulks inexperienced pilots when landing, is that of leaving a machine out in the middle of the ground after the finish of a flight instead of wheeling it up to the railings. In a case like this a man may easily have his attention distracted by the machine on the ground, and in endeavouring to avoid it may fly into another machine in the air.

Those accustomed to aerodromes will no doubt be able to suggest for themselves quite a number of other bad habits which are likely to produce accidents, and one would, therefore, like to suggest to the proprietors of every aerodrome that they should appoint, as soon as may be, a really strong man as Aerodrome Manager, and that they shall have in their agreement with the tenant of each shed a clause under which the tenant submits himself to a fine if his pilots or pupils disobey the orders of the Aerodrome Manager. In fairness it might be as well to have an arrangement that in case of dispute the matter might be submitted to the Committee of the Royal Aero Club for arbitration.

It would probably be necessary for pupils to deposit a certain sum against such fines when joining the schools, which might, perhaps, choke a few pupils off at the start, but would ultimately have an excellent effect. Or, perhaps, it might be possible for the Aero Club to refuse to grant certificates to pupils who refused to pay their fines.

At any rate, now that our aerodromes are becoming so crowded with pupils and machines of all sorts, it is time that we set our houses in order if unnecessary fatal accidents are to be avoided.

A Sound Opinion.

The best comment yet made on the "Circuit d'Anjou is that of Mr. C. C. Turner, the certificated aviator, who writes in such eminently common-sensible style in the *Observer*. Says he:—

"It is perfectly clear, from the circumstances in which the Grand Prix de l'Aero Club de France was flown, that contests of this nature may depart altogether from the original purpose for which they were organised—namely, to encourage the development of the best aeroplane and the best motor, and degenerate into a mere test of human daring.

"If it could be claimed that the race flown under such circumstances provides any demonstration of aeroplane 'form,' what I have written would be nonsense, for it would be said that the Blériot, Morane, Zens, and Nieuport firms, who permitted their pilots to start, are manifestly the only constructors who had sufficient confidence in their machines. It was not a question of pilots even; for who would say that the fliers whose employers declined to send them aloft, including such men as Védrines, Vidart, Tabuteau, Busson, and Prévost are one whit inferior to Garros, Bedel, des Moulinais, Legagneux, Hélen, Espanet, and Hamel, who started? And of these seven only two finished the first day's course; so on the 'form' of machines we should have to conclude that one Blériot is not so good as another, and that the Nieuport and Zens are clearly inferior to the Blériot!

"So that it comes to this, for the sake of prizes and the kudos of victory seven men risked their lives. It is only necessary to read the story of the race to realise this.

"The result of the race proves nothing, save that Garros is not only a very wonderful flier, but also a lucky one. It adds a big event to the long list of victories achieved by Blériot monoplanes, but it carries us not a bit further in constructional progress. Leading pilots in contests of this kind are not even free agents in selecting the machines they will fly. Their apportionment among competing firms is determined by the circumstances of their contracts, and it is notorious that many a good flier flies on a machine that he regards as inferior to others simply because it is a question of earning his livelihood."

Lecturers Wanted.

One of the leading London Polytechnic institutions is about preparing a programme of lectures for next autumn and would be glad to hear from competent men who could read papers on aviation. Practical subjects of general interest are desired rather than highly scientific discourses. For instance, a lecture from a pilot on "How to handle an aeroplane" would be welcome, or one on "Tuning engines." The lecturers are well paid, and anyone who would care to give a lecture can be put in touch with the organisers by writing to The Aeroplane.

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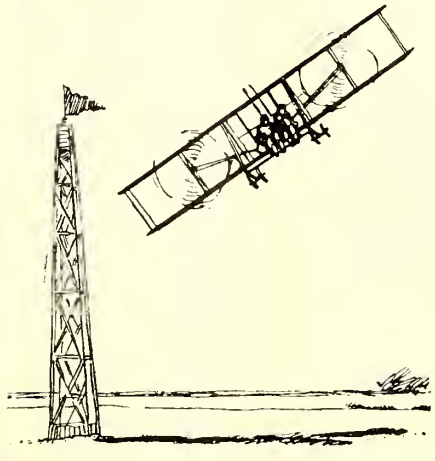

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The Possibilities of the Dirigible Balloon.

BY W. E. de B. WHITTAKER.

Centuries before the first balloon drifted lazily through the air there had come to the mind of man some idea of the first principles of aviation. The gliding fall of a stiffened piece of papyrus may have suggested to the early Egyptian or Greek or Roman a possible method for the overcoming of the mysteries of flight; but certain it is that some conception of the principles of gliding flight has been existent through all the ages of civilisation. But lack of initiative, perhaps, and of motive power certainly, has kept back the development of the science until recent years. No aeroplane can fly without an efficient engine, and as the latter, too, is of recent discovery, the mind of man turned in past days to other means of aerial locomotion. Thus, the balloon came into existence, preceding the aeroplane by more than a century.

The problem of controlling the direction of flight on a free balloon exercised the minds of those interested from the beginning; but, again, the lack of motive power was a bar to progress. And so matters drifted until the production of the internal-combustion engine made so much possible. The modern dirigible then came into being and remained supreme until the aeroplane arrived, and in its turn became supreme. The successes of the aeroplane during the last three years have completely eclipsed the dirigible, and the number of those who still remained faithful to the lighter-than-air machine was very small compared with the supporters of aviation.

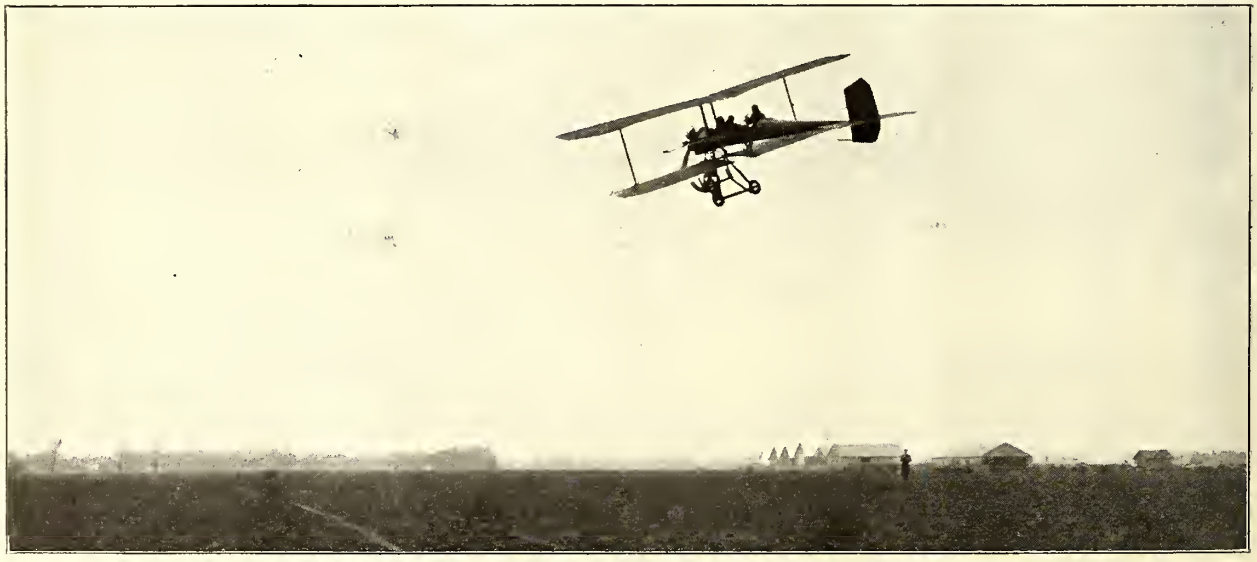
The disaster to *La Republique*, the constant failures of the various Zeppelin balloons, the slow speed and apparent unhandiness of the unwieldy craft all affected public opinion until few believed that there was any future for the dirigible.

Two years ago I said that, as a weapon of war, the airship was useless, and I believe I accurately represented facts at the time. Yet I was completely wrong, as I think the future will prove. There is nothing entirely useless—save wasps—and each thing has its place in the scheme of existence. The mistake people frequently make is to compare too freely. Because the attributes of the dirigible are not those of the aeroplane it does not follow that the dirigible has no virtues of its own. Its sphere of action is different, that is all. And such is, apparently, the growing belief of those who direct the fortunes of certain great foreign nations. The military leaders of France and Germany can hardly be accused of deficiency in intellect, and yet they authorise the spending of large sums of money on experimentation with dirigible balloons. They cannot be entirely in error, and perhaps the truth of this is best shown in the recent long flights of the Zeppelins and the Parsevals.

The chief objections to the dirigible have been on the score of the great expense, large size, unwieldiness, and lack of power to combat a high wind, all of which are legitimate and true. Forty aeroplanes can be built for the price of one large dirigible. The same number can be housed in the space occupied by one power-driven balloon. The cost of maintenance is also on the credit side of the aeroplanes. Innumerable further points of adverse comparison might be made, but the mistake lies in comparing at all.

Let us consider a few of the feats that are possible for dirigibles which no aeroplane can perform. The dirigible can rise and fall perpendicularly. If its engines fail it can remain in the air for long periods. An immediate descent is not essential. On emergency its rate of rising is far in excess of that yet attained by any aeroplane. It is capable of great variation in speed. Several pilots can be carried, so that no pilot need get cramped and tired. If necessary, absolute silence can be maintained by stopping the engines and drifting. It is possible to remain over one point without moving for indefinite periods. These various points, all impossible of attainment in the aeroplane, are all of great importance, and even alone justify the existence of the airship.

Airships have one peculiar advantage when employed on army work—they are ideal for night work. I think it will be generally admitted that flying by night on aeroplanes is a matter of great difficulty and of infrequent occurrence. Only dire necessity would induce an aviator to take the heavy risks of a flight on a moonless night. A smash on landing under war conditions is almost inevitable. On the other hand, the airship can travel through an entire night with perfect safety. After manœuvring into the correct position, the engines can be stopped, and the dirigible will drift in silence across an enemy's camp. If the dropping of bombs ever forms a practical portion of aerial work the airship, and not the aeroplane, will do the more deadly execution. A greater quantity of high explosives can be carried on a dirigible than on the most advanced of modern aeroplanes. The dirigible of to-day can travel at speeds of almost fifty miles an hour, which gives them the mastery of any wind short of a hurricane. As the airship is



One of the Brèguet military biplanes flying with a passenger at Douai.

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capable of carrying much greater weight than the aeroplane it is possible to fit it with efficient machine-guns and carry a fairly large supply of ammunition. Thus its offensive and defensive qualities are high.

Contests between aeroplanes and airships are unlikely to be of frequent occurrence, as it is not probable that an airship will ascend in the presence of a large hostile force of aeroplanes unless it has at the same time a strong escort of friendly aeroplanes. Common sense is as frequently an attribute of the soldier as it may be of the stockbroker. An airship could make a good defence against aeroplanes, but any large number of the latter could undoubtedly make short work of the largest dirigible. But then victory often falls to overwhelming numbers.

It is possible both to receive and transmit wireless messages on an airship. The silence required for the efficient reception of wireless signals is obtained by stopping the engines. According to Lieutenant Waterlow, R.E., "while over Winchester last year [in an airship] the operator caught signals from ships in the Solent and also from the Eiffel Tower."

The advantages of the airship for naval work are many. During a blockade an airship can remain almost stationary in the air for long periods of time, watching constantly. It shares with aeroplanes the power of detecting the presence of submarines, though it has the additional advantage of being able to move at a very slow speed, thus making the search more thorough.

There is much to be said for the dirigible balloon. Both the airship and the aeroplane have their definite duties, which will become more and more diverse as time goes. Great caution is necessary in the carrying out of airship experiments, as mistakes are very costly. The cases of the Clément-Bayard and the Barrow balloon ought never to be repeated. It is clear that we cannot afford to remain idle while the great Powers construct large numbers of power-driven balloons.

A state of preparedness is very blessed. It may be too late next year. Time and tide and the stress of war wait for no man. But while we continue to endeavour to discover the perfect type of airship by means of expensive operations at Farnborough, let us bid for security by purchasing some successful dirigibles of a modern type from firms at home or abroad who have knowledge of their subject.

French Military Notes.

On June 18 Lieutenant-Aviator de Marmies with Sapper Jousselin on a Maurice Farman biplane left Buc at 3.30 a.m., and landed at Verdun at 5.20 p.m. The distance is about 285 kilometres, and the time taken was 1 hr. 50 mins. This is the third occasion on which this officer has flown from Buc to Verdun.

A terrible and unusual accident occurred at Douai on June 19. At about 7 a.m. five Bréguet biplanes were in the air, despite the thick fog. Two of them, piloted respectively by Captain-Aviator Dubois and Lieutenant-Aviator Peignian collided head to head at a height of 50 metres. Both machines were wrecked, and both officers were killed instantly. In endeavouring to avoid each other both had done the same thing—risen—with fatal results. They both possessed recent brevêts.—W. E. de B. W.

Continental Notes.

Dirigible records for height are few and far between, and the aeroplane has left it far behind in the altitude attained. Sometimes, however, an effort is made, and the result is good. On June 18, at Issy-les-Moulineaux, the Astra dirigible *Eclaireur-Conté*, carrying six persons, rose to a height of 3,050 metres (approximately 10,000 ft.). It left ground at 9.2 a.m., and redescended at 12.30 p.m. This dirigible is driven by two 75-100 h.p. Chenu motors.

The Clement-Bayard monoplane (50-h.p. Gnôme), piloted by M. Gastinger, flew from Villacoublay to Issy-les-Moulineaux in exactly four minutes.

After the conclusion of the Circuit d'Anjou, Renaux on a Maurice Farman biplane, with three passengers on board, and Bernard piloting a similar machine, but with one passenger, flew from Angers to Buc on June 19. They kept together for the entire journey. Perreyon, with a passenger, took his tandem Blériot to Etampes on the same evening.

Lieutenant von Falkenheim was killed on June 21 at Doeberitz. No accurate details of the smash are yet available.

Mr. Hucks' Paris-London Experiences.

As noted in The Aeroplane last week, Mr. Hucks, with Mr. Harold Barlow as passenger, flew from Paris to Hardelot on Monday last. On the Tuesday evening they started to come to England, but at about 500 ft. they began, as Mr. Hucks put it, "knocking their heads against clouds," so decided it was not safe to start. Consequently, they came back to Hardelot, and Mr. Hucks amused himself during the evening taking up a number of passengers, among them being Mr. St. John Harmsworth, Lord Northcliffe's brother, who was badly smashed up and practically crippled in a motor accident some time ago. It speaks well for this gentelman's nerve that he was not afraid to tackle an aeroplane flight, though he had to be lifted into the machine by his attendants.

Mr. Hucks told the writer on his return that when they arrived at Hardelot on the Monday night the wind was blowing at something like 40 m.p.h., and the sea was in places dashing over the esplanade, so that he was barely able to find room on the sand to make a landing.

Early on Wednesday morning they started on their next stage, and got to Eastchurch, averaging about 60 m.p.h. all the way. While there, Mr. Hucks took up a number of the officers of the Naval Wing of the Royal Flying Corps, all being exceedingly pleased with the behaviour of the new type Blériot. In the evening, at 7.30, the wind having gone down, Mr. Hucks and Mr. Barlow started for Hendon. Contrary to usual custom, they followed the south bank of the river over the bad country in Kent and Surrey, but had a very good journey until they got well inland, over Bromley and the Crystal Palace, when they found the wind very troublesome as far as Hendon. In spite of this, the 70 odd miles was covered in about 1 hr. 10 mins.

Italian Notes.

Since I penned my last notes the Italian Army has lost a promising officer in the person of Lieut. De Persüs, who fell a victim to his first right-hand turn with, I understand, a rotary motor. Have we the right to expose pupils to risk by allowing them to use tricky machines?

The Asteria people are turning their attention to monoplanes. Their Italian passenger record was carried off last week by Cobioni on the Caproni monoplane, who carried a guest for three hours round Somma Lombardo. Altogether, things are getting very healthy at that excellent school.

A quieter time seems to be settling down on the belligerent aviators, one of whom, according to the war correspondents, has lately taken to sea-bathing on the Tripoli coast, his machine giving the naval divers considerable trouble for some time afterwards. Talking of the sea reminds me that an epoch-making monoplane is attributed to Calderara's retirement from the public eye. May it be so! It is a hydro-aeroplane and has been tried at Spezia. It is said to carry six passengers.

Ramassotti and a pupil, who have been doing an advertising tour in Sicily, send me a card, wherefrom I see that the Chiribiri motor still uses the radiator placed behind the tractor as a screen to keep the wind off the pilot. Though not suggestive of any desire to lessen head resistance, the system certainly seems to keep the engine in good condition, to judge from actual performances.

M.1., which is now doing its trial flights, is reported as being as satisfactory as the smaller dirigibles. She is fitted with two of the F.I.A.T. marine motors giving 300 h.p. Each drives a group of propellers, and can be used independently of or in conjunction with the other. As I mentioned before, implements of destruction are very much to the front on board.—T. S. Harvey.

Aviation in Ireland.

Readers of The Aeroplane in Dublin and district will be glad to hear that at last there is a prospect of an aviation school being opened near Dublin. Messrs. M. G. Loder and Co., of 25, Bachelor's Walk, have taken land for a school, and two Blackburn machines are on order for school purposes. Work has already been commenced on the shed, and it is hoped that the school will be at work in a few weeks.

Another Engagement.

Yet another aviator is about to take unto himself a bride, the happy man in this case being Mr. Seymour Metford, Mr. Chéreau's popular assistant manager in the British branch of the Blériot Company. Mr. Metford is to marry Miss May Rimmer, the well-known violinist. Sincere congratulations to both.

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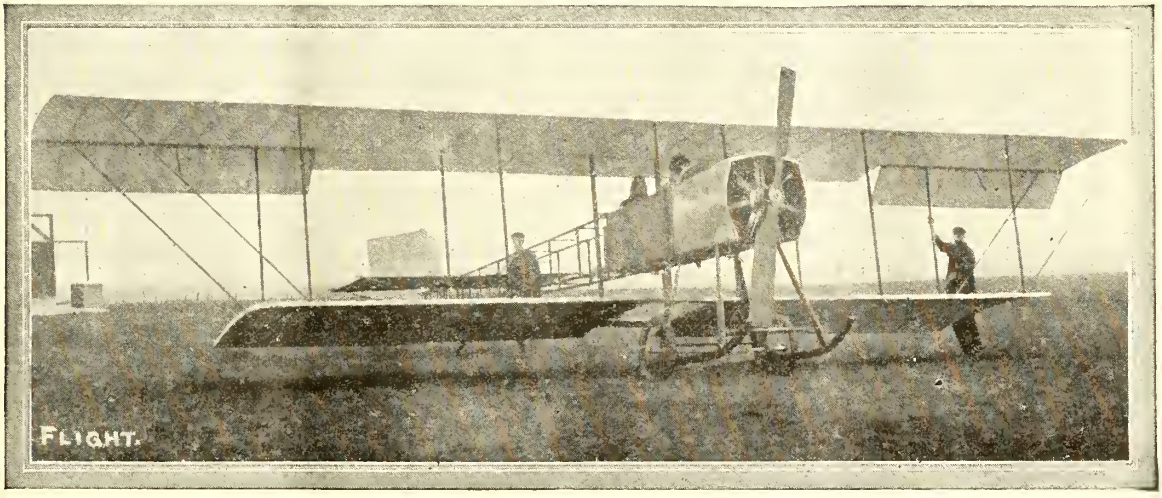

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The I.C.S. Tour.

Despite the appalling weather of the past week, Mr. Slack has been making splendid progress with the International Correspondence School's educational tour, and is proving himself to be a pilot of the very first class.

As was recorded last week, he flew on Sunday, the 16th, from Hendon to Bedford. A large number of people paid for admission to the ground where Mr. Slack was to land, and the "gate" money was given to the County Hospital. Mr. Slack, on landing, said that he had felt bitterly cold, and had a very "rocky" time crossing the Chiltern Hills. There were streaks of mist along the route, so that, flying at 1,500 ft., he could not see people on the ground, though he recognised St. Albans and Luton as he went by. He was weather-bound all Monday.

On Tuesday evening, the 18th, Mr. Slack started from Bedford towards Leicester, but on the way ran into a thick fog, and was forced to come down at Market Harborough, where he was held by bad weather till Wednesday evening. Then, in spite of the air being in quite a bad state, he pluckily started for Leicester at 7.10 p.m.

Many thousands of people had congregated at the field in Thurmaston Road, where Mr. Slack was to alight. Presently he was seen arriving, and then disappeared again, so that people began to fear that an accident had happened; but it appears that he had made a detour over Birstall and Rothley, having failed to locate the ground owing to the mist. This time, however, he made no mistake, and made a perfect landing; but, owing to the wind and the somewhat restricted ground, the machine ran along and hit a fence, chipping a piece out of the propeller. This is the first breakage Mr. Slack has had in his career as an aviator, and he was naturally somewhat annoyed at spoiling his excellent record. Still, the damage was so slight that there was nothing really to trouble about. Mr. Slack's reception was most enthusiastic, and he was carried shoulder-high to the car which was waiting for him, and even when he reached his hotel thousands of people assembled outside and made night hideous till he appeared and made a little speech to them. Mr. Ramsay MacDonald, M.P., wrote regretting that political business prevented him from welcoming Mr. Slack to his constituency, but he hoped that Mr. Slack would return with pleasant memories of "one of the best towns in the whole of England."

On Thursday evening Mr. Slack, who was accompanied by Mr. E. B. Seymour Norton, of the International Correspondence Schools, Ltd., gave a lecture at Leicester to a crowded audience, who were most enthusiastic, and explained to them the elements of flying. Incidentally, it is good to learn in the course of his lecture he paid tribute to the British pioneers, such as Mr. Cody and Mr. Roe, and illustrated the early efforts and later successes of British aviators, so that these lectures are likely to do a large amount of good, and to impress on the people of this country that something really has been done here in the past.

On Friday and Saturday the wind prevented further progress, but on Sunday Mr. Slack, departing from the route arranged for him, flew from Leicester to Nottingham (the starting and landing grounds being between twenty-one and twenty-two miles apart) in twenty-five minutes—a splendid flight, considering what a bad wind there was all Sunday. At the time of Mr. Slack's arrival it was registered locally as thirty-five miles an hour, and gusty at that, so that Mr. Slack is evidently showing that he is quite up to the best French form as an aviator. Being a Nottingham man himself, Mr. Slack naturally wished to visit his own town as soon as possible, and he was received with enthusiasm.

The Week-end at Hendon.

The wind, with its usual perversity, was again high on Saturday, though it had little effect on the amount of flying. A fairly large crowd testified to the growing interest in aviation. Trial flights were made by Mr. Hucks on the new two-seater Blériot (he finished his flight by a perfect spiral *vol plané*), Mr. Hamel on a 50-h.p. Blériot, and Mr. Valentine on the Bristol monoplane.

Shortly after four the cross-country race took place. The starters were M. Verrier (M. Farman biplane), M. Valentine (Bristol monoplane), M. Hamel (50-h.p. Blériot), and Mr. Hucks (70-h.p. Blériot), and they started in that order. Two journeys were to be made between the Aerodrome and Bentley Priory, a few miles beyond Elstree. The only competitor to make the double journey was Verrier, and he was disqualified later for having turned short of the mark on the first circuit. The other competitors could not find Bentley Priory, and gave up the race. As they returned to Hendon, three balloons competing for the Hedges-Butler Challenge Cup passed over the Aerodrome at a height of about 4,000 ft. Mr. Hamel circled round one of these balloons several times, exchanging salutes with the occupants.

The four lap speed contest, in which Messrs. Verrier, Hucks, and Hamel started, took place about five o'clock. Mr. Hucks, who started at scratch, won by 100 yards after a good race.

Some little time after this race, several aviators made flights, and one time there were eight or nine machines in the air. M. Verrier was busy for over two hours, carrying passenger after passenger. Mr. Hucks took up several passengers, as also did Mr. Grahame-White. Mr. Ewen, now happily quite recovered from his recent accident, flew the new Caudron two-seater biplane, as also did M. Guillaux. Mr. Hubert made several journeys on the Grahame-White Farman. Lieut. Porte took up Mrs. Stocks as passenger for a ten minutes' flight on the British-built two-seater Deperdussin monoplane. Mr. Sabelli also appeared on the small Deperdussin. Mr. Noel and Mr. Turner were flying as usual on Grahame-White biplanes. Mr. Valentine flew his Bristol, and Mr. Hamel, with Miss Davies, performed on the two-seater Blériot, all in excellent style.

On Sunday the wind was too high for much flying, but Mr. Hucks made two ascents on the Blériot, beyond which nothing happened.

The Aerated-Watercraft Demonstrations.

That enterprising and occasionally unintentionally humorous paper, the *Daily Mail*, has now announced its great scheme for demonstrations with "waterplanes, or sea-aeroplanes." Why they should be called "sea-aeroplanes" instead of simply "hydro-aeroplanes" is not explained, and neither is the reason given for calling them "waterplanes."

Mr. Claude Grahame-White is announced to take two machines to various places along the South Coast during August, though the writer is given to understand that Mr. Grahame-White's pilots will be in charge, and Mr. Grahame-White has plenty of business to attend to beyond flying for seaside trippers who will not pay their sixpences to come inside the Hendon Aerodrome when they are in London.

In describing the performances that are to be, the *Mail* says that visitors will have "the opportunity of watching those graceful 'amphibians' wheeling in the air to seaward and alighting gently on the surface of the water." Why the machine should be compelled to wheel to seaward is not explained, but in the interests of passengers who may wish ultimately to reach their happy homes it is to be hoped that the machines will also occasionally wheel to landwards, by kind permission of the *Daily Mail*. It is also possible that humour may occasionally be imparted to the performance by machines alighting with a mighty splash, as illustrated in Mr. Holt Thomas's lecture the other evening.

After all, half the fun of the water-chute is the splash at the bottom.

It is also announced "there will be passenger flights at a fixed charge." Kindly note there will be no flights *à la carte*.

For the comfort of potential passengers it is announced that "the now very rare eventuality of an enforced descent is a much less serious matter over the sea than over the land." As a matter of fact, it is not the descent *over* sea or land that matters so much as the substance *on* which one descends.

A very interesting fact is that "at each town the waterplanes will visit a special shed, and an enclosure will be erected for the waterplanes." There is something rather touching in the idea of the little "waterplanes" going a-visiting, and a well-known aviator suggests that quite a nice enclosure could be made for them by floating round them a string of corks, with a little flag stuck on the top of each.

Of course, the real information is contained in the paragraph which says, "Since waterplanes came into prominent public notice at the meeting at Monaco last spring, great advances in their construction have been made—how great was indicated by the masterly flying of Commander Samson and his three brother-officers before the King at Weymouth." It may, however, be interesting to append to this the further information that practically nothing new in the way of hydro-aeroplanes has been produced since the Monaco meeting, and that the three brother-officers of Commander Samson, R.N., did not fly hydro-aeroplanes at Weymouth at all; but two of them flew machines fitted with safety floats. Also, that the famous *S.41.* was actually built before the Monaco meeting took place.

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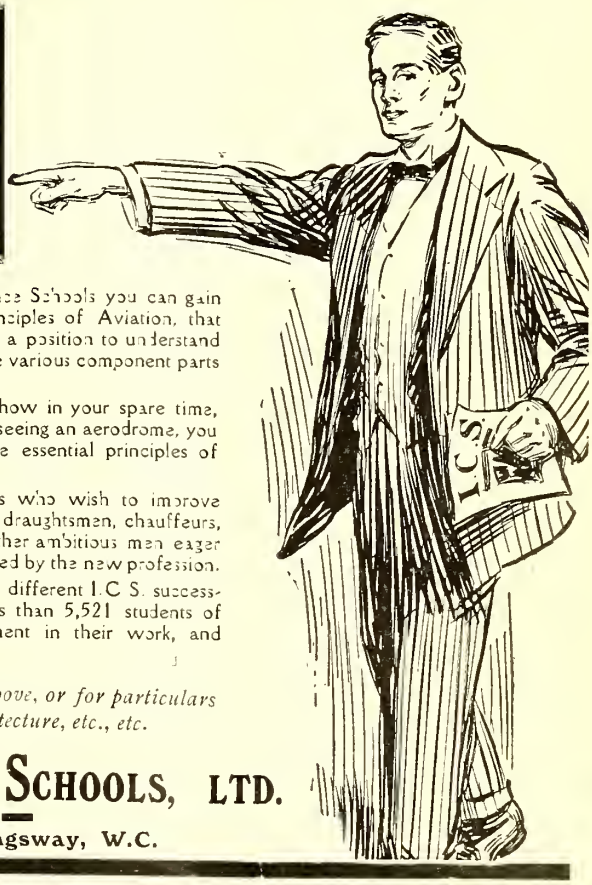

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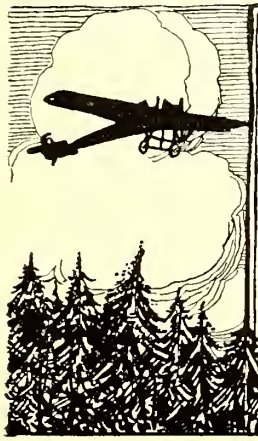

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Experiences in the "Circuit d'Anjou."

By E. V. SASSOON.

I woke up on Sunday, June 16th, to find that the bad weather which the Blériot pilots had been praying for had arrived, beyond a shadow of doubt.

After a bathless wrestle with clothes came breakfast, where I unsuccessfully tried to dissuade Hamel from eating two eggs.

We arrived on the ground at 8.0, and found the whole place in a state of what our friend Mr. Dashwood Lang calls "French claim." Constructors were either forbidding or urging their pilots to fly. Védrines, to the front as ever, was writing on his time-sheet his opinion on the trifling differences there were between the Commissaires Sportifs and assassins in general.

One well-known constructor was telling a perspiring official that, if the race took place, he would resign from the Aero Club de France, and carry a plaint to the courts, whereas an even better-known constructor was assuring another equally perspiring official that, unless the race was run, not only he would resign from the Aero Club, but also all his pilots, and they all, severally and individually, would carry innumerable plaints to uncounted courts. In fact, if all the threatened resignations have taken place, the French Aero Club must now consist of half a dozen placid and inoffensive balloonists, dreaming of the days when they, and they alone, were kings of the air and idols of the mob.

Nature, not to be outdone, was all this time blowing a gale which was officially given as being 20 m. a second on the ground. This, I am informed by those versed in the intricacies of higher mathematics, works out at 45 miles an hour, and some of the framework hangars were swaying very perilously. However, Garros cut the Gordian knot by starting, and comparative peace was restored.

I had great difficulty in finding the particular Commissaire Sportif whose chief official object of existence was to stand by the plane and take me to be weighed out as passenger. When he did arrive, he joyously exclaimed that he had seen me years ago in Switzerland, in the year that he had become engaged to the lady who was now his adored wife. Time was flying, so, uttering a short cry of delight, I grasped him affectionately by the arm and guided him to the scales whilst congratulating him on his good fortune.

We got back in time to see Bedel on a Morane go through the most terrifying gyrations, ending up with a side-slipping dive and a disappearance behind the tribunes.

The wind was so bad that our wings had to be held by mechanics at the start. Blériot and Leblanc were discussing whether the two-seater should be allowed up in the gale at all. At the last second Blériot came up and said the weather was too bad, but Espanet had just gone with a passenger on his Nieuport, and that settled the matter as far as we were concerned.

We rose swiftly at the start, so as to allow for the drop that we had noticed everyone made over the tribunes, and then followed our course along the Loire. Hamel flew beautifully, and seemed to anticipate the gusts, so that the biggest remous were only able to fling us up or down on an even keel.

The country, as I had already been told, was impossible from a landing point of view. Picture clumps of woods varied by small plots growing young vines about a couple of feet high, wired in rows, and an occasional village or field of beetroot. Even the islands in the Loire were quicksand.

Five minutes after the start the engine stopped, but it picked up again a second or two afterwards, and only when we had landed after the first round I learned that Hamel had switched off to see if his engine was overheating.

It took us an hour and ten minutes to do what Hélén on his black racing Nieuport, the *Corbeau*, did in twenty-seven minutes.

It was between Cholet and Saumur, when we had the wind behind us, that the remous were, as usual, strongest. After one terrific drop, Hamel looked round to see if I was still there, as his head had hit the cabane. The nastiest part of the trip was from Saumur back to Angers, as here we had the wind on our beam, and were, in consequence, very shaken about. Just about two-thirds of the way, a plug went, so that we had to fight the gusts with decreased speed. Twice Hamel had to dive to straighten her out, and, to add to his difficulties, it was just about here that he was violently ill.

Words cannot express the admiration I feel for the way that boy stuck to it through the last ten minutes of our flight. He was too tired to correct the gusts before they came, as he had been doing, and, with only six cylinders firing, we were being flung in all directions, as one never knew where the next gust would come from. So he struggled towards the aerodrome, which was now in sight, when, just as we were over some wooded country outside the ground, there was a loud bang, and our engine stopped. One of the valve springs had gone. Luckily she picked up again, and with now only five out of our seven cylinders in action, we crawled, rolling and pitching, dropping all the time, towards our goal. It was only by a few feet that we shaved the finishing pylon, and then with a perfect landing we arrived, having taken two hours and twenty-three minutes over a course which in fine weather we could have done in less than an hour and a half.

Hamel was a little shaky after his trying experiences, and here I would like to put in a word of appreciation of that well-known lady pilot, Mme. Delaroche, who, directly we arrived, took us to a hangar, where Hamel was able to rest on a mechanic's bed, and plied us both with cold chicken and champagne before showing the slightest curiosity as to our experiences, so showing herself the true "sportsman" that she is.

We heard that Espanet, on his Nieuport, had had a terrible buffetting—so much so that his passenger, Garde, collapsed and had to be taken away in an ambulance, leaving a mechanic to take his place on the second round.

After a short rest we started off on our second round, and I would here like to correct the statement that has appeared in the Press that Hamel gave up at Angers and was replaced by another pilot.

No sooner had we risen than the elements resolved that the one thing necessary to complete a unique experience was a rain storm, and this they thoughtfully provided. Hamel had the full brunt of this, as not only was he in front of me, but I had the advantage of being able to stream-line myself and find shelter under the shield. The remous and wind were, however, better, until we were near Cholet, when, if anything they seemed to be at their worst.

Though we had not intended making our compulsory stop there on this round, the engine began running unevenly and dropped 100 revolutions, so Hamel decided to take his stop then and have it seen to. He made a perfect landing against the wind, but, just as we were rolling and losing way, a gust lifted us 15 ft., and then let us down with a crash, breaking the propeller and one of the struts of the under carriage, and buckling both wheels, which piece of bad luck put us out of the race.

Espanet's Nieuport was suffering from a seized piston, so the only one of the original starters still going was Garros, pursued by Brindejonc des Moulinais, who had started three hours late.

At Cholet we remained till seven, when the younger Séguin (of Gnôme engine fame) gave us a lift back to Angers. Just before we started, Allard came over in the big five-seater Caudron, and when, on landing, it was seen that one of the four passengers was a lady, the enthusiasm of the crowd was immense.

By this time the weather had quite cleared up, and it was almost a perfect flying evening. Brindejonc arrived on his third round, and told us he had landed in a beetroot field during the storm, luckily without damage, and had just been able to get out again. We just got back to Angers in time to congratulate Garros on being the only pilot to qualify for the second day. Poor Astley was, I heard, absolutely broken-hearted at not having been allowed to follow us, but Esnault-Pelterie told him he had bound himself to allow none of his pilots up under a penalty of 20,000 francs, so, if Astley wished to go up, he must pay the fine himself.

Even in the evening, when all the planes went over the line for the flights which entitled them to get back their entrance fees, Astley tried to get his tanks filled, so as to do one circuit, but his manœuvre was discovered, and he had to content himself with flying over Angers and the surrounding country for an hour in excellent style.

To sum up one's impressions, although from a purely racing point of view the meeting could not be described as an unqualified success, the lessons learned were by no means insignificant.

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go up in practically any weather. A point to be emphasised is that, though in fine weather the pilot on the swift single-seater can make satisfactory general observations, in really bad weather, when the pilot's full attention is needed for navigating his craft, an observer is needed.

Speaking for the machine I was on—a tandem Blériot with 70-h.p. Gnôme, similar to the one flown in the Aerial Derby by Hamel and Miss Davis, but lighter, and with the wings cut away at the rear edge so as to give the passenger a wide range of vision—I can confidently say that no movement of troops would have been missed by the observer at any period of the flight. The bad weather would also make it safer to fly at lower altitudes, as we were often passing through thin clouds that, though only dimming my view, must have made us invisible from below.

The victory of practically the same machine used by Morane at Bournemouth, two years ago, shows how little the possibilities of aeroplanes and the increased skill of pilots were then realised.

Garros is, I should say, the finest pilot living. That he will one day be killed is, I am afraid, almost certain, as he is reckless in the extreme. A favourite "stunt" of his in landing is to pass over the sheds, and then from only that height do two quick banked spirals before reaching the ground. He keeps way on his machine by switching on and off, and simply spins round, banked almost vertically. I was told that he did this at Angers on landing after his third circuit on the first day, though he must have been almost dead beat.

It is to be hoped that, if any of our pilots must try to emulate this feat, they will at least content themselves with doing it at a safe height, or over deep water.

A Parting and an Amalgamation.

It is reported from Paris that the working arrangement between M. Robert Esnault-Pelterie and Vickers, Ltd., has been terminated, and that in the near future R.E.P. machines built in France may be seen over here, possibly in charge of a well-known British pilot. It is also reported that the R.E.P. firm and the Bréguet are to amalgamate, so that the chief exponents of all-steel construction will have common interests. A British Bréguet firm is shortly to get to work, but it is not yet clear whether it will handle R.E.P.'s as well.

The Re-instatement of the Blériot.

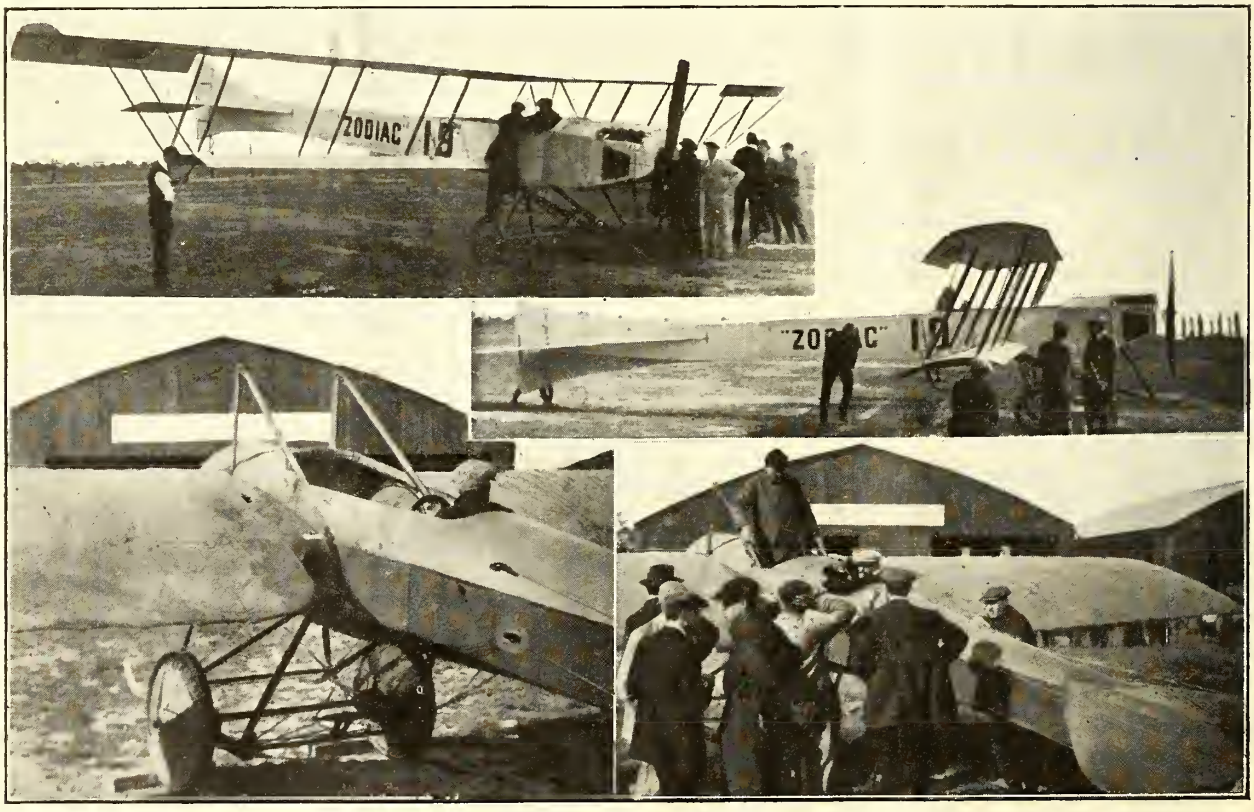
It has been common knowledge for some time that owing to certain unexplained breakages in Blériot machines belonging to the French Army, officer-pilots in France have been forbidden to fly Blériot machines, and acceptance of Blériots on order has been suspended. In most cases it is probable that the breakages have been due to the criminal carelessness with which the French military machines have been cared for, but M. Blériot made certain detail modifications in his machines, in deference to military opinion. Now, however, after the performances of Garros, on the single seater, and Hamel in the "Circuit d'Anjou" the authorities are convinced of the safety of the machines, and instructions have been issued that the Blériots on order for the Army are to be rushed forward with all possible speed.

A New Bristol Pilot.

Ex-pupils and future pupils of the Bristol School will be interested to know that Mr. F. Warren Merriam has been definitely appointed as instructor at the Bristol School at Brooklands. He is an exceedingly steady flier, and should prove a valuable assistant to Mr. Hotchkiss.

The First Deliveries to the Royal Flying Corps.

The second of the Avro biplanes has now passed its tests, and has been duly accepted by the War Office for the Royal Flying Corps. The pilot in the tests was Lieut. Parke, R.N., and during the one hour test flight he took up Lieut. Atkinson, R.F.A., as passenger, and flew round between Farnborough and Basingstoke. Since then Lieut. Fox, R.E., Royal Flying Corps, has flown the first of the Avro biplanes from Farnborough to the Lark Hill Camp on Salisbury Plain, a flight which is good in itself, but is considerably better when one realises that it was the first time Mr. Fox had been in the machine. The third Avro ordered is likely to be delivered at a very early date, and the firm are to be congratulated on having got their machines through the works and the tests so quickly, very few of the other machines on order having yet been delivered, the Avro being the first of the British machines.



Photographs of some non-starters in the Grand Prix, taken by Mr. Sassoon. Above is the new Zodiac. Below on the left is the four-seater Deperdussin, and on the right the high-speed two-seater of the same make.

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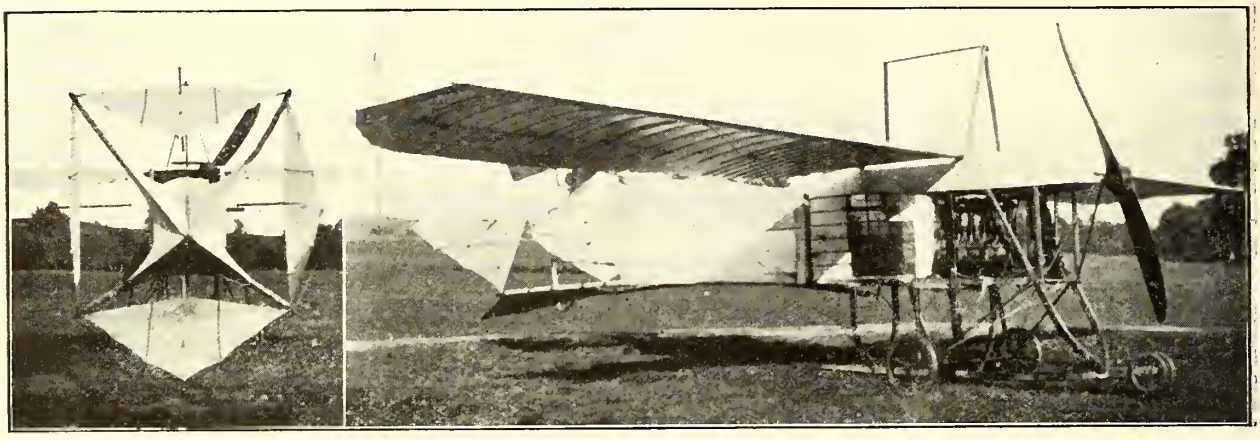
A Visit to Mr. Cody.



Mr. Cody's 120 h.p. Monoplane, showing the extraordinary tail view, and the transparent "cabin."

A few days ago two of us made an early morning visit to Mr. Cody on Laffan's Plain. Leaving town at 1.30 in the morning, we reached the Plain just after three o'clock, to find Mr. Cody seated in his new monoplane ready to make a flight.

No adequate description of this machine can be given verbally, so the accompanying photographs must be studied to follow its design. Roughly, it is a monoplane of large span driven by a 120 h.p. six-cylinder water-cooled Austro-Daimler engine, which transmits its power through gearing to a tractor screw 12 ft. in diameter and 13 ft. pitch running at half engine speed. Everything is as original in conception and execution as is usual from Mr. Cody. It is extraordinary how little, if any, he owes to the efforts of other designers. In the contemplation of the materialised products of Mr. Cody's brain there is no support or consolation for those whose chief aim in life is to trace the devious routes of deliberate plagiarism. He owes little to any man.

Shortly after our arrival he made two straight flights, both of which showed excellent promise. The first flight was made with his throttle only half open, and the second with his engine giving full power. Though it is difficult to judge merely by sight, there appeared to be a great possible variation in speed. His fastest speed at present appears to be about sixty-five miles an hour, though he expects to increase greatly on this when he gets his new tractor, the present one not quite satisfying him.

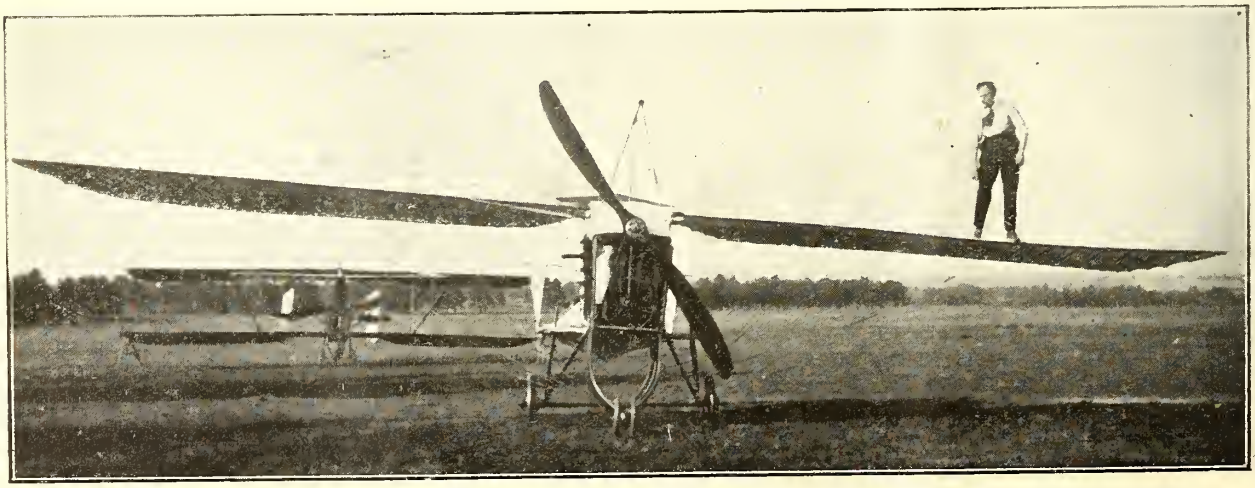
Laffan's Plain bears no resemblance to a croquet lawn, and is about as suitable a site for an aerodrome as is a damp cloud a meet seat for concentrated thoughts on abstract holiness. The surface is an excellent model of a mountainous district on a small scale. Small mounds, precipices two feet high, and innumerable trees of hardy but undignified appearance are dotted about in rich profusion. And yet Cody's landing chassis on both the biplane and the monoplane stands up to the most severe shocks imaginable.

He made a landing while I was there, on the monoplane, with a wind behind, that would have wrecked the strongest of conventional chassis. Yet nothing happened. Nothing was broken. Even so Mr. Cody was not satisfied, and has since replaced the new type chassis by one of the old type fitted to his biplanes.

The silence of his big engine was remarkable. At a distance of half a mile it was almost inaudible, and even at close quarters there was no more noise than is usual in the case of a powerful car engine.

One has heard much lately of the handiness on the ground of certain well-designed, officially-constructed biplanes, and of the clever idea of articulating the tail skid. Mr. Cody's great monoplane can be driven on the ground with all the sinuosity of a taxicab and with perfect exactitude. In my presence Mr. Cody made a complete turn on the ground in a space of nine yards—that is to say the machine turned in less than its own length. To show how easily it can be done, it is enough to say that Mr. Cody, if the aeroplane is pointing the wrong direction, turns it under engine power without aid from his mechanics, who simply stand by.

A little later in the morning Mr. Cody took me up in his "Circuit" biplane, fitted with a 60 h.p. Green engine. The first circuit of the ground was made at an average height of about 200 ft. We passed over the Aircraft Factory and one of the dirigible hangars. Mr. Cody's method of leaving ground is peculiar and surprising. After a bumpy run of about 50 yards he invariably charges a small bank with his engine all



Mr. Cody, who weighs 16 stone, takes a little promenade on his wings to test the springing of his new chassis.

out and bounces into the air. There are landing chassis in existence which would regard this treatment as barbarous, but the serenity of the Cody chassis remains undisturbed.

The second circuit was made at an average height of 10 ft. Mr. Cody faithfully followed the contour of the ground. He banked at the turns with one wing tip almost touching the surface. We climbed up small hills and shot down minute precipices, all without touching. As a final proof of the efficiency of his machine, he charged a clump of high trees at a height of about 20 ft., and I prepared for rapid exit from the dreams and troubles of this weary life. When within 40 ft. of the trees Mr. Cody pulled back his control lever and we rose after the manner of the most intelligent helicopter, and cleared the small forest with many feet to spare. It was splendid, but by no means a soporific. At the conclusion of my flight Mr. Cody took Mr. Tookey up for several circuits of the ground, during which flight the wind rose and added to the interest of things.—W. E. de B. W.

Many points in connection with Mr. Cody's new machine are particularly worthy of note. Firstly, it has practically been built entirely by the Cody family, only one assistant from outside having worked on it. Mr. Cody believes that a military machine should be weather-proof, and he is deliberately leaving the new monoplane out in rain and sun, cold and heat, to prove its fitness for its work. It has never even a tarpaulin over it.

The Aviator's Wedding.

A CONGRATULATORY ODE.

Dedicated to Mr. and Mrs. Claude Grahame-White.

On wings of fancy lightly borne
We hailed the happy wedding morn
When our best pilot, Grahame-White,
Essayed his matrimonial flight.
His vast "Cathedral," dim and grey,
Was lent by Cody for the day.
The organ, blown by Stanley Lewin,
Was deftly played by Mr. Ewen;
While Mr. Wakefield led the show,
For he's a Vicar, as you know.
Robert Loraine, as well he can,
Acted as Grahame-White's best man;
And once he gave a hollow groan,
Because he thought the ring had flown.
The Bride, in airy fabrics clad,
A sheaf of Arum lilies had.
Young Robinson, "The Nation's Gift,"
With Marcel did her train uplift.
The Bridegroom wore most stylish clothes
(On strike *his* Taylor never goes!)
The Bridesmaids put on airs, 'tis true,
In motor veils of pale sky-blue.
Sweet arias the choir then sang,
And all the Bells of Hendon rang.
Congratulations, quite a host
Came early, by aerial post.
Off with the films flew Mr. Hucks
To Cheltenham Cinema de Luxe.

The guests dropped in from out the sky,
For though they flew, they scorned a fly.
Some crossed the sea, some flew from town.
And some from Bath had just Combe Down.
In a huge hangar, in the shade,
The costly wedding gifts were laid;
With, as detective at the door,
Our trusty friend, McCallum Mohr.
Brave Beaumont gave "My Three Great Flights,"
McKenna sent some army kites;
A cigarette-case, aptly chased,
Was Latham's gift, in perfect taste.
Védrines and Garros sent together
A trophy of an eagle's feather.
A fine stuffed heron in a case
From Moorhouse, held an honoured place.
From Mrs. C. de Beauvoir Stocks
Two pairs of fleecy knitted socks.
A chest arrived from Zee Yee Lee,
Containing pure Celestial tea.
From Oscar Gnossipelius
A cast of "Peg," the Flying 'Oss;
While in the area were seen
Skye terriers, from Frank McClean
An heirloom came from far away,
From Brindejonc des Moulinais.

Good Luck!

Mr. Claude Grahame-White and Miss Dorothy Taylor, who are to be married to-day at Chelmsford.

The Women's Aerial League presented
A can of petrol, sweetly scented.
Babe "Jumbo" gave a trunk, brand new,
He sent the bride a "Mirror" too.
And Mr. Adams, fond of jokes,
Sent apples from his "Hill of Oaks."
While Salmet vowed on tour to take
To all kind friends some wedding cake.

Now *Vol au vent* around was passed,
And potted larks were swallowed fast;
With wedding cake from Buszard's rare,
And also "trifles, light as air."
A lordly brace of flying fish
Came steaming in a silver dish.
Béchâmel sauce was present, too,
And champagne corks most gaily flew.
Requested by the genial host,
Commander Samson gave a toast
In which he firmly did declare
That Britain's strength lies in her 'air.
He hoped the Bridegroom and the Bride
All Wright through life would safely glide;
Together soar to heights of bliss,
And every cloud of trouble miss.
Then came farewell; too slow the train
So off they went by aeroplane.
Old shoes and rice, most neatly blended,
From Beattie's biplane swift descended.
And thus we leave the happy pair
To spend their honeymoon in Ayr.

Cheltenham. A. Nadin.

[As The Aeroplane went to press some days before the ceremony, the above is merely an intelligent anticipation of what did not happen by a lady who was not present.—Ed.]

The Week's Work.

MONDAY, June 17th.

Brooklands.—At Deperdussin School, early, Capt. Dawes and Lieut. Bellairs out on brevêt machine. Lieut. Gill also out for short flight.

At Sopwith School, Messrs. Hedley and Webb-Bowen and Capt. Herbert making circuits solus on Farman. Lieut. Wadham with Mr. Raynham. In evening Mr. Raynham one circuit.

At Vickers School, early, Capt. Wood flying *No.* 5 in great style for 10 minutes.

At Bristol School, Mr. Bendall short solo. Capt. Agnew two left-hand turns and afterwards flying two figures of 8. Mr. Holyoake doing straights with confidence. Mr. Bendall up with Capt. Macdonell. Lieut. Anderson two straights, then two circuits to left. Mr. Holyoake then straights again. At 7 p.m., Mr. Hotchkiss out solus, but too bad for school.

Dover.—In morning, Mr. Chalmers out on Farman, but had to come down owing to engine trouble.—H. H. V.

Eastchurch.—Mr. McClean made early start for Eastbourne on 70-h.p. tractor Short, flying *via* Tunbridge Wells, his native town, arriving Eastbourne in 1 hour 17 mins. Austrian monoplane, "Etrich," for Naval Wing, arrived by road, unpacked, assembled, and a short engine test given.

Hendon.—At Grahame-White School, good morning's work, Baroness Schenck, Major Liles, Capts. Nicolas and Salmond doing straights, and Mr. Kershaw circuits on *F.3.*, and Mr. Noel taking Mr. Cholmondeley as passenger for first trial—13 lessons in all. Evening too windy for pupils.

At Blériot School, M. Gaudillon first to arrive in early morning and before wind rose at about 6.30 a.m. put in some useful rolling.

At the W. H. Ewen School work started at 4.30 a.m. Messrs. Edmund, Ware, Sutton, H. H. and J. H. James were all flying well on the Blériot. M. Baumann had a nice flight of 15 mins. at over 100 ft. on the 28-h.p. Deperdussin.

At Deperdussin School, Capt. "X," Lieut. Reilly, Mr. W. Brock and Mr. Harrison rolling in morning. All the pupils out in evening.

The Plain (R.F.C.).—Early in morning, Lieut. Fox did two very good straights on the 70-h.p. Blériot. Later took *F.8.* out, and made a splendid circuit for half hour. Capt. Brooke-Popham out on *F.7.*, and made a spendid flight for half hour. Capt. Loraine did four good straights on 50-h.p. Nieuport. Lieut. Conner rolling on Nieuport afterwards for 20 minutes.

Waterloo (Liverpool).—Mr. Birch started out on school machine, but at moment of starting propeller broke without apparent reason. Something on ground probably thrown into propeller by one of wheels.

TUESDAY, June 18th.

Brooklands.—At Sopwith School, evening, Mr. Raynham one circuit, finding wind too bad for school work.

At Vickers School, evening, Capt. Wood made several straights on *No. 2*, followed by Capt. Darbyshire and Mr. Knight. Capt. Wood then made one or two straight flights on *No. 5.*

At Bristol School, 7 p.m., Mr. Hotchkiss for solo, but wind too bad for pupils. Later, Mr. Bendall for solo.

Eastchurch.—In evening, Herr Stengler put the "Etrich" monoplane through its hour's flight before some Admiralty representatives, the machine behaving in highly satisfactory manner. Capt. Gordon, R.M.L.I., out on school Biplane *T.1.*, Lieut. Gregory, R.N., out on triple-twin *T.3.*, Lieut. Hewlett, R.N., out on school biplane. Capt. Gordon then took up Miss Malone as passenger on one of school biplanes.

Falmouth.—M. Salmet on Blériot left about 5 p.m. for Fowey. Weather glorious and very little wind.

Hendon.—At Grahame-White School, morning hopeless. Evening very windy, only work test flights by Mr. Noel on *F.3.* and Mr. Turner on *F.5.*, and one lesson as passenger to Mr. Cholmondeley.

At Deperdussin School, pupils out at 5 a.m., working till 6.30. Mr. Harrison doing straights.

Market Harborough.—Mr. Robert Slack on Blériot arrived in course of I.C.S. Tour on way to Leicester.

The Plain (R.F.C.).—In evening Capt. Loraine made two splendid flights on Nieuport, flying for 20 minutes each. Lieut. Porter out on *F.7.*, doing good flying for 20 minutes. Three flights in all. His next flight he took passenger up for 15 minutes. Last trip he gave very good display of flying at great height for 30 minutes. Later Capt. Brooke-Popham took over *F.7.* and also did good flight for 15 minutes. Capt. Fulton paid flying visit in evening, flying *F.8.* for 15 minutes. Staff-Sergt. Wilson took *F.7.* out afterwards, remaining up for 20 minutes. Corpl. Ridd out on *F.8.* for 30 minutes, doing some splendid flying. These two non-commissioned officers are making really good fliers, and it is hoped by all to see them on one of the new monoplanes soon. Staff-Sergt. Wilson took *F.8.* out, doing excellent solos. In evening later Lieut. Fox flew new Avro over from Farnborough, time being 1 hour. This machine has very good speed. Lieut. Fox later gave an excellent display. Great credit due to Lieut. Fox for good flying in rough and gusty weather. Capt. Allen out on Bristol monoplane, flying well for 20 minutes.

The Plain (Bristol School).—Wind and rain in morning. Mr. Busteed out in evening testing new monoplane. Mr. Pizey a trial, and afterwards tuition to Messrs. Lindsay Campbell and Geoffrey England on monoplane. Mr. Kemp very fine flight on two-seater monoplane. Mr. Lindsay Campbell rolling on monoplane. Good solos by Mr. Rawson Shaw, Dr. Cordner, Mr. Lister, and Lieut. Hartree.

WEDNESDAY, June 19th.

Brooklands.—At Avro School, early, Lieut. Atkinson rolling on school machine.

At Sopwith School, early, Capts. Powell and Herbert, and Mr. Hedley made circuits on Farman, followed by Lieut. Wadham, making straights. Work stopped by wheel coming off and breaking propeller.

At Vickers School, early, Capt. Wood flying *No.* 5, and Capt. Darbyshire out on *No. 2.*

In evening Mr. Moorhouse amused himself in horrible wind for 7 mins. on R. and M.

At Bristol School, Mr. Bendall for solo. Fog over ground but lifting quickly. Capt. Agnew solus three circuits. Mr. Bendall with Mr. Holyoake. Mr. Hotchkiss took out Anzani monoplane to test new Y-type engine. Ran very well, monoplane lifting almost like a Gnôme. Mr. Bettington then flew four straights on same machine. Mr. Hotchkiss then went up behind Lieut. Wilmer on biplane for four straights. Lieut. Anderson also flying straights on biplane. Mr. Bettington, junr., then flew four straights on monoplane, landing quite well. Mr. C. Bettington then out for straights again and made a bad landing, smashing propeller and slightly damaging engine.

Dover.—Mr. Hucks seen on his cross-Channel journey going splendidly.—H. H. V.

Eastchurch.—Lieut. Gregory, R.N., on "Etrich" for 20 mins., but had misfortune to break a skid and propeller in landing. Mr. Hucks arrived on Mr. Barlow's new two-seater 70-h.p. Blériot with Mr. Barlow as passenger. After having three inlet valve springs replaced and waiting for wind to drop they proceeded to Hendon. Mr. Alec Ogilvie out on N.E.C.-Wright with Mr. Fowler as passenger, climbing quickly to 300 ft. Engine stopped, necessitating sharp descent to avoid dykes.

Hendon.—At Grahame-White School, windy morning, so pupils only making straights with Mr. Noel on board. Major Liles, Capts. Salmond and Nicolas, Commander Yeats-Brown, and Messrs. Scully and Hoelscher all out. In evening, test flights by Messrs. Noel and Turner showed wind too high.

At Blériot School, 6 a.m., Messrs. Hall and Clappen busy practising, former doing one straight and then four right-hand circuits in good style. Mr. Clappen also got off ground and kept going very well for two straights. Wind soon rose and stopped further work. In evening, Messrs. Barlow and Hucks arrived from Issy-les-Moulineaux *via* Hardelot and Eastchurch on former's new tandem two-seater Blériot, making excellent *atterrissage* at 8.40 p.m.

Work at the W. H. Ewen School started shortly after 6 a.m. with some good straights on the school Blériot by Mr. Sutton, after which Mr. Edmund put in some good practice.

At Deperdussin School, early, Messrs. Brock, Harrison, Capt. "X," and Lieut. Reilly rolling. In evening Mr. Harrison straights.

Leicester.—Mr. Slack on Blériot arrived in very bad weather from Market Harborough on I.C.S. Tour.

The Plain (R.F.C.).—In morning, Capt. Loraine took Avro out, and made two splendid flights for 20 minutes. Capt. Brooke-Popham out on *F.7.*, doing some good solos for 15 minutes. In evening new Bristol monoplane arrived. One of the new Royal Aircraft Factory machines started from Farnborough early, but owing to dense fog the pilot, Capt. Burke, had to descend at Tidworth Park. The machine (*B.E.3*) did not arrive until evening, when Lieut. Fox flew it over in grand style, although weather was very bad. The wind very gusty when he started from Tidworth. Passed over camp about 700 ft. up, but could not land until he made three circuits. Lieut. Conner out on Nieuport, flying well for quarter hour.

The Plain (Bristol School).—In morning thick fog, followed

by strong wind. In evening only flight by Mr. Busteed on monoplane with Mr. Pizey as passenger.

Waterloo (Liverpool).—Mr. Birch out again, but after short straight flight decided to bring machine in owing to wind.

THURSDAY, June 20th.

Brooklands.—At Avro School, early, Lieut. Parke, R.N., air test on school machine, followed by Lieut. Atkinson rolling. Evening, Lieut. Parke made a couple of straight flights in wind.

At Hanriot School, Mr. Sippe took new Hanriot out for five minutes in wind about 7 p.m. Engine now running properly and machine made an excellent show.

At Bristol School, 7 p.m., Mr. Hotchkiss for solo, but conditions too bad for pupil work. Later, Mr. Bendall for solo.

Eastchurch.—Lieut. Malone, R.N., out on triple-twin.

Hendon.—At Deperdussin School, Lieut. Reilly straights, promises to became first-class pilot. Mr. Brock, Capt. "X," and Mr. Harrison rolling. Evening, Mr. G. Sabelli on racer circuitss, and Mr. Gill straights.

Liskeard.—M. Salmet landed at Liskeard from Fowey after very rough flight in westerly gale; was blown past Liskeard and landed eight miles farther on, whence, after rest, he flew back against the wind to Liskeard, afterwards giving a couple of excellent exhibition flights.

The Plain (R.F.C.).—In morning Capt. Loraine did two splendid flights on Nieuport for half hour. Bristol monoplane, which arrived on Wednesday evening, was taken out by Capt. Allen for some good flying, but on landing one wing, propeller, and all the under-carriage were damaged, and Capt. Allen's legs were slightly hurt. Later Lieut. Fox flew *B.E.3.*, doing three flights in all, first by himself, second with Major Jebb as passenger, and third with Lieut. Porter. In evening Capt. Brooke-Popham out on *F.7.* for 15 minutes. Lieut. Fox out on *B.E.3.*, doing four flights, first by himself and other three with a passenger. Capt. Loraine flying in good style on Nieuport, after which Lieut. Conner did good circuit on same machine. Lieut. Porter and Sapper Strugnell out on *F.7.*; latter hopes to be another pilot for military wing. Staff-Sergt. Wilson put in two flights, last with Sapper Breading, R.E., as his first passenger. Capt. Brooke-Popham flew *F.8.*, Corpl. Ridd afterwards taking over *F.8.* Capt. Loraine another splendid flight on Nieuport for 20 minutes. Lieut. Porter on *F.7.* again. Lieut. Fox out on *F.7.* with passenger, Sapper McCudden, who hopes to become pilot. Lieut. Fox finished evening by taking Driver Carter up on *B.E.3.*

The Plain (Bristol School).—In afternoon Mr. Pizey on *No. 66a*, and afterwards on *No. 19* with Mr. Geoffrey England. Then for monoplane flights, taking Mr. Greig, Mr. Hammond and Mr. Barnwell. Mr. Busteed tuition to Messrs. Barnwell and Greig. Mr. Kemp first solus on *No. 66a*, then tuition to Lieut. Christy, and then for practice on monoplane *No. 58.*

FRIDAY, June 21st.

Brooklands.—At Avro School, early, Lieut. Parke, R.N., air testing on Avro-Green biplane. Lieut. Atkinson and Mr. "Darracq" rolling.

At Deperdussin School, early, Lieut. Bellairs rolling on brevêt machine.

At Vickers School, early, Capt. Wood out with *No. 5.* Mr. Hunter making straight flights on *No. 2.*

At Sopwith School, early, school Farman engine being overhauled. Mr. Raynham took Capts. Hubert and Howell and Lieut. Wadham out on Burgess-Wright.

At Bristol School, 3.30 a.m., Mr. Hotchkiss found conditions good. Capt. Agnew then up solus doing two 8's and an extra right-hand turn. Mr. Holyoake then solus for four straights. Lieut. Wilmer next in pilot's seat with Mr. Hotchkiss behind, flying four straights and one circuit. Mr. Bendall then out solus and again with Mr. Holyoake. Mr. Hotchkiss took out biplane *No. 62* for test after re-erection, and found it perfect. Capt. Agnew then with Mr. Hotchkiss on same machine to start engine for Mr. Holyoake, who had stopped at far end of ground. Lieut. Wilmer out twice, first time taxi-ing and second doing short straight flights. Capt. Agnew out solus on *No. 62*, flying three circuits. Mr. Bendall solus on *No. 62*, and Mr. Hotchkiss solus on *No. 29.* Mr. Hotchkiss afterwards taking up brother of Capt. Agnew for "joyride," flying round course and then out over Golf Links and Byfleet.

In evening, Mr. Hotchkiss solus, weather bad, and at 8 p.m. up again, weather no better. These the only two flights made at Brooklands.

Eastchurch.—Naval school machines out early putting in an hour's work before breakfast with Capt. Gordon, R.M.L.I., Lieuts. Hewlett and Malone, R.N., piloting in turn. Lieut. Gregory, R.N., made circuit of island on *T.2.* at some 700 ft. Commander Samson, R.N., took Lieut. Sheppard up as passenger on school biplane. About 8.35 p.m. aeroplane sighted over Faversham, apparently making for London, well up.

Farnborough.—Mr. Cody out doing straights on his new monoplane; machine evidently astonishingly fast, and promising to do big things when engine properly tuned. Machine flew at first attempt without alteration of weights or adjustment of planes. Afterwards Mr. Cody out on biplane with Mr. W. E. de B. Whittaker, of The Aeroplane, and others.

Hendon.—At Grahame-White School, good morning's work on *F.3.* Mr. Noel out for test at 4.3 a.m., after which Major Liles, Capt. Salmond, Commander Yeats-Brown, and Mr. Fuller for solo straights. Capt. Nicolas and Mr. Hoelscher doing straights with Mr. Noel, Mr. Kershaw circuits, and Mr. Cholmondeley first rolls. Meanwhile, Mr. Turner out on *F.5.* for a few test flights. In evening, Commander Yeats-Brown and Capt. Nicolas and Messrs. Scully and Cholmondeley out on *F.3.*, latter finishing by catching propeller on a bump while rolling—no fault of his, of course. Meanwhile, Mr. Grahame-White doing circuits and flying over surrounding country on *F.5.*, and M. Dessoutter testing 35-h.p. Anzani Blériot, now rebuilt after its smash.

At Blériot School, in early morning, Mr. Hall flew straights and M. Gaudillon rolled very well.

The W. H. Ewen School were out from six in the morning. Messrs. J. H. James, Ware and Apcar got in some good practice on the Blériot.

At Deperdussin School, Lieut. Reilly improved straights, others rolling. In evening, Lieut. Porte out on two-seater with Mrs. Stocks as passenger, flying exceedingly well.

The Plain (R.F.C.)—In morning Capt. Brooke-Popham two good flights, one with Sapper Strugnell on *F.7.* Lieut. Fox again to front, and flew Blériot excellently for 15 minutes. Lieut. Porter and Corpl. Ridd both out on *F.7.* Lieut. Porter took *F.7.* out and flew out of sight. He came back without machine, having to land for lack of petrol. He finally came back at 9.45 p.m. Lieut. Fox with Sapper McCudden made good tuition flight on *F.8.* Staff-Sergt. Wilson two good flights on *F.8.* for 20 minutes. Lieut. Fox and Sapper McCudden another trip on *F.8.*, flying 20 minutes. Corpl. Ridd on *F.8.*, putting in good circuits at good height. Lieut. Conner out on Nieuport for 10 minutes, after which Capt. Loraine for 20 minutes. Capt. Brooke-Popham, O.C. at Lark Hill, three very excellent flights for the first time on new Avro. The O.C. now flies the Deperdussin, Avro, and Bristol biplane. Lieut. Fox out again on *B.E.3.*, taking Lieut. Conner and L.Corpl. Jeffreys as passengers; flew Blériot for 15 minutes, doing good solos. About midday Lieut. Fox out on *B.E.3.* for 48 minutes to Salisbury and back. At same time Capt. Loraine out on Nieuport. These flights made in strong wind, and praise is due to these two officers for attempting them. In evening, in spite of wind, Lieut. Fox and Capt. Brooke-Popham out, Lieut. Fox on *B.E.3.* by himself, afterwards taking up Lieut. Hartree as passenger for 20 minutes. Capt. Brooke-Popham on Avro for half hour. Lieut. Fox another flight with Lieut. Hartree on *B.E.3.* Capt. Brooke-Popham again on Avro. Lieut. Fox again on *B.E.3.*, taking up Lieut. Bolton as passenger, and then with Capt. Shaw-Stewart. Lieut. Conner made splendid flight on Nieuport, with right and left-hand turns. Lieut. Fox up again with Lieut. Housden. Corpl. Rigby, R.E., with Lieut. Fox on next flight, and later Driver Goldstone with same officer

The Plain (Bristol School).—Mr. Pizey first out giving tuition to Messrs. Barnwell and England and Lieut. Christy. Mr. Smith-Barry tuition to Mr. Greig and Lieut. Christy. Mr. Kemp with Lieut. Christy, and solus on *No. 58.* Messrs. Lister and Rawson Shaw and Dr. Cordner solo flights with figures of eight and good landings. In evening Mr. Kemp tuition to Mr. Greig and Lieut. Christy. Mr. Busteed with Mr. Barnwell, and Mr. Smith-Barry taking Messrs. Featherstone and Geoffrey England. Good solos by Messrs. Rawson Shaw and Lindsay Campbell, Messrs. Barnwell, Campbell and Greig getting in rolling practice on monoplanes. Mr. Smith-Barry solus on monoplane, followed by Mr. Kemp, who afterwards took Mr. Barnwell and Lieut. Christy. Mr. Hammond took Messrs. Featherstone and Geoffrey England. Mr. Lister capital solos, as also Dr. Cordner, and Mr. Rawson Shaw.

SATURDAY, June 22nd.

Brooklands.—At Avro School, early, Lieut. Atkinson and Mr. "Darracq" making straights on school biplane. In evening, Lieut. Parke made two straight flights in nasty wind. Later, wind having dropped, Lieut. Atkinson and Mr. "Darracq" making straights.

At Deperdussin School, early, Capt. Dawes and Lieut. Bellairs making straights on brevêt machine

At Vickers School, early, Mr. Macdonald arrived from

Erith on new Vickers (*No. 6*) with Mr. Challenger as passenger. Machine flies extremely well and has many novel features. Shortly after arrival Capt. Wood and Mr. Macdonald left for Hendon on same machine. Missing their way in fog, and landing to discover their whereabouts, machine ran into thick corn at Aldenham and inverted. Neither of occupants hurt, and damage to machine not important, but enough to need workshop attention at Erith. Flight quite good enough to prove machine a first-class piece of work. Capt. Darbyshire making straight flights on *No. 2*.

At Hanriot School, Mr. Sippe left on new Hanriot for Farnborough at 5 a.m., and arrived without accident.

At Bristol School, Mr. Hotchkiss solus for one circuit. Lieut. Anderson four circuits to left, flying in good style. Mr. Hotchkiss up with Mr. Summerfield (prospective pupil) for couple circuits. Up again with Capt. Macdonell, latter picking up the controls very quickly. Capt. Agnew then went for brevêt, which he secured in good style. First part took him 17 mins., keeping steady height of 100 ft. and landed 5 yards from mark. Second part took 16 mins., flying at steady 200 ft. and landed right on mark. This is another Bristol pupil who has been at the school less than three weeks. He has been ready for brevêt for more than a week, but stayed on to get practice. Mr. Bendall up with Capt. Macdonell for tuition. Mr. E. Holyoake doing straight flights at about 50 ft. Lieut. Wilmer afterwards solus for two straights. Mr. Bendall then up with Lieut. Wilmer. Mr. Hotchkiss up on *No. 62* to test alterations in control of machine. Then up on same with Lieut. Anderson.

Dover.—Mr. Chalmers out at 5.15 a.m. with passenger on his Farman. Went off well but wind getting up he was caught in a "pocket" and was brought down. Neither pilot nor passenger was hurt, but struts and two wheels on the chassis were broken. These were repaired during the day and he went back to aerodrome in the evening.—H. H. V.

Eastchurch.—In early morning, M. Guillaux arrived on Caudron biplane, having landed near Sittingbourne on Friday night en route France to Hendon. In evening school machines out. Also the Hon. Maurice Egerton, Mr. Alec Ogilvie on N.E.C.-Wright, Mr. Jezzi who was busy taking up passengers, having taken up eight or nine during the evening, including one lady. Commander Samson flew to Dover on 70-h.p. biplane.

Farnborough.—Late in evening, Mr. Cody out on biplane with Mrs. C. G. Grey as passenger over dirigible sheds and camps on Farnborough Common, and across country by Fleet Pond. Soon afterwards Mr. de Havilland on *B.E.2.* also appeared, flying in beautiful style, and Mr. Sippe on new Hanriot also went up, reporting very bumpy weather up to 500 ft., and steady wind above that. Machine evidently flies in excellent style and has plenty of lift, and when descending showed remarkably good gliding angle. Later on Mr. Cody doing straights on new monoplane, but engine sulky.

Hendon.—At Grahame-White School, no flying in morning. Evening's work reported elsewhere.

At Blériot School, very misty up to 6 a.m., when M. Aubert went up on brevêt machine and did two very good left-hand circuits. He then went up again and, practising for certificate tests, did one figure 8 and a couple more left turns, and finished up with nicely executed banked right-hand turn. Mr. Hall meanwhile out on taxi and did straight and circuit very nicely. Messrs. Gaudillon and Sacchi, who has now returned, doing straights.

At the W. H. Ewen School the pupils were out in the early morning. In the afternoon M. Guillaux, who had arrived in the early morning on the new 60-h.p. Caudron biplane from Paris with Mr. Ramsay as passenger, made several fine exhibition flights. The speed and climbing power of the machine caused great admiration. Ewen was out flying on the same machine, after which several passenger flights were given.

At Deperdussin School, Lieut. Reilly long straights, landing well and handling machine neatly. In evening, in spite wind, Lieut. Porte on two-seater with Mrs. Stocks as passenger. Mr. G. Sabelli on racer, flying excellently.

The Plain (R.F.C.).—In morning Capt. Fulton on Avro did two splendid flights. Later Capt. Brooke-Popham two flights on same machine, second time taking Lieut. Porter as passenger. Capt. Loraine two very good flights on Nieuport. Capt. Brooke-Popham took Sapper Strugnell on *F.7.* for instruction. Lieut. Porter and Sergt. Prett out on *F.7.* later. Lieut. Fox took Sapper McCudden for instructions on *F.8.* Lieut. Fox four splendid flights with Lieut. Porter on *B.E.3.* In evening, in spite of strong winds, Lieut. Fox out on *B.E.3.* whole evening, gliding down from 1,600 ft. Everybody speaks well of this machine and its pilot. Capt. Brooke-Popham out on Avro for half-hour, also reaching 1,000 ft. Corpl. Ridd out on *F.7.*, doing nice solos. Lieut. Fox took up Sapper Lewis for half hour. Capt. Brooke-Popham on Avro took Corpl. Ridd. Lieut. Fox again on *B.E.3.* for half hour, and then out on 70-h.p. Blériot for 20 minutes. Capt. Fulton again flying Avro, and gave splendid display. Capt. Brooke-Popham on Avro, taking Corpl. Jones as passenger. *B.E.3.*, piloted by Lieut. Fox, made two more flights, both being passenger flights.

The Plain (Bristol School).—Mr. Busteed first out, followed by Mr. Kemp, who took Lieut. Christy and Mr. Barnwell. Mr. Smith-Barry good flight with Mr. Featherstone, and Mr. Hammond with Mr. Geoffrey England. Major Boyd Moss clever solo, with figures of eight and fine landing. Mr. Lister doing very sharp right-hand turns. Other solos by Lieut. Ashton, Dr. Cordner and Mr. Rawson Shaw. Messrs. Campbell, England and Greig rolling on monoplanes, Mr. Busteed bringing work to a close with trial on new monoplane.

SUNDAY, June 23rd.

Brooklands.—At Vickers School, early, Lieut. Beatty making straight flights on *No. 5*.

At Spencer School, early, Mr. Spencer out for a few minutes.

Nothing doing rest of day. Blowing gale.

Eastchurch.—The Hon. Maurice Egerton out on triple-twin Short biplane.

Hendon.—At Grahame-White School, Capt. Nicolas out in morning, and somewhat rashly attempted a flight at about 30 ft. Made rough landing, carrying away chassis without anything fouling propeller, and then rose to 30 ft. again. The second landing naturally wiped out most of the machine. Landing without chassis presents certain difficulties. Evening very rough, and nothing done but few test flights, and a very fine flight by Mr. Hucks on new 70-h.p. two-seater Blériot.

At Deperdussin School, Mr. Brock and Capt. "X" rolling on taxi, latter ended by breaking skid and turning turtle.

Nottingham.—Mr. Slack, I.C.S. educational pilot, arrived on Blériot from Leicester in 30 m.p.h. wind; very fine performance.

A Narrow Escape.

Lieut. Clive Waterlow, R.E., Royal Flying Corps, and the crew of the *Beta* had a narrow escape from what might have been death for them all on Wednesday last. The baby dirigible had been out manœuvring, and on coming back it drifted somewhat out of its course, with the result that she headed straight for the big dirigible shed. On nearing the shed an attempt was made to get the machine over it by putting on full power and elevating; but there was not quite enough room to clear it, and the car of the dirigible hit the shed end on, the whole framework crumpling up, and the balloon flopping across the roof of the shed.

Fortunately, the envelope did not burst, and the wind dragged the balloon off the roof of the shed. It then brought down by letting out gas some little distance away. If the envelope had caught on any of the projecting parts of the roof of the big shed, and burst, of course the car would have slid off the roof, and the inmates would have been dashed to pieces.

Only a day or two before, the *Gamma* was deflated, owing to being caught in a gust as she was coming out of her shed, so that she had to be deflated by the ripping panel to save her from being torn against the shed.

Mr. Ewen's Tour.

Mr. W. H. Ewen has arranged with the *Daily Mail* to make an aeroplane tour of the northern counties, starting north from Hendon for Cambridge this week when weather permits. If all goes well he will make exhibition flights at Cambridge. The base of operations there will be the meadows adjoining the University Officers' Training Corps rifle range.

Peterborough will have an opportunity of seeing him next. If the weather holds good, Mr. Ewen hopes to go on to Lincoln after making some flights at Peterborough. Hull may hope to see him on Friday or Saturday.

Mr. Ewen has been tuning his Caudron biplane with the 60-h.p. Anzani engine. "I have the greatest confidence in my machine," he said, "and I am looking forward to putting it to the proof which this long tour will give it." It flew splendidly when M. Guillaux brought it over from France on Friday. On that occasion his passenger was Mr. Ewen's partner, Mr. Ramsay, son of Professor Sir William Ramsay, of Aberdeen University. During the flight they attained a height of 10,000 ft. They had practically no trouble all the way, so there are high hopes of a splendid tour.

Correspondence.

The Editor of THE AEROPLANE *is not answerable for the opinions of his correspondents. All communications intended for these columns must be accompanied by the sender's name and address, not necessarily for publication. Letters should be addressed* THE AEROPLANE, 166, *Piccadilly, W.*

Mr. Ogilvie's Strut Experiments.

Sir,—With regard to the table of results contained in your copy of Mr. Ogilvie's article on strut tests, the heading of the last column but one should have been printed $\frac{1}{6R+W}$, *not* $\frac{1}{6R \times W}$.

I do not think the same mistake occurs anywhere else in the article; but in every case the formula should read $\frac{1}{6R+W}$.

Eastchurch. V. LE CREN.

The Coming of the Hydro-Aeroplane.

Sir,—With reference to your leader this week on "The Coming of the Hydro-Aeroplane," you rightly call attention to the growing evil tendency of getting results by simply eramming on the power. To our mind this has always been wrong, and we have endeavoured to get results without excessive power.

You also say, "It should not, however, be necessary to put 70-h.p. into an aeroplane of any type to make it lift two people satisfactorily at 60 m.p.h., either from land or water." We quite agree with you in this, and would like to call attention to the Avro biplanes which we have delivered to the British War Office. These have proved themselves unsurpassed by any machine in the world. Although only fitted with 50-h.p. Gnôme engines, they do over 60 miles an hour, climb over 400 ft. a minute, and have a very large carrying capacity: the other day Lieut. Parke, R.N., carried a 12-stone passenger, tanks full of oil and petrol, to 1,000 ft. in 4½ mins. with engine only doing 1,070 r.p.m., instead of 1,200.

These results are not obtained by cutting down the factor of safety in the machine, as they passed the War Office "three times load" test without the slightest apparent signs of straining; also the Laffan's Plain rolling test over a very bad portion of the ground with a stiff wind at the rear.

We do not wish to blindly claim the present results of the latest Avro biplanes as being unsurpassed if there are any machines which can give all-round better results with a 50-h.p. Gnôme.

We hope the Editor will excuse us writing at such length, but as the extra good results of our latest War Office machines have apparently not yet been realised, we feel it is about time your English readers were informed that England is not so backward as they may possibly think, and there is no need to go abroad for aeroplanes. A. V. ROE.

(For A. V. Roe & Co.)

Sir,—Your article on the hydro-aeroplane in to-day's issue has proved interesting reading, especially as I think that the all-round machine of the future will be capable of rising from or land on either land or water, and should this be so, undoubtedly the most pressing need is a sound landing apparatus. To my own mind the float should be more of a nature of a plane, that is to say, should have a high aspect ratio, and, in fact, be nearly the same span as the lifting plane of the machine, and to a float of this type I am sure it would be easy to attach two or four wheels for landing on terra firma. I also think that this high aspect ratio type of float would not be found to drag when leaving the water, and at the same time, when the machine is in the air, this float, if properly designed, should also give a good amount of lift. I may be wrong! What is your opinion? My ideas on floats arose through noticing that so many bodies act the same in water as in air.

I am very interested in the problem of human flight by man-power only, and am thinking of carrying out some experiments; can anyone give me any information on this subject. If so, it would be very acceptable, as so much time can be wasted in finding out what has already been discovered by the pioneers.

Cambridge. HARRY VOSS HALL.

"The All-Foreign Advertisement Tour."

Sir,—The letter by your correspondent, M. Louise Elliott, under the above heading in THE AEROPLANE of June 13th is, in plain English, contemptible, and it is beyond me to understand why anyone who is really interested in aviation should attempt to put a damper on such remarkable enterprise as shown by the *Daily Mail* and their airman, Monsieur Salmet.

In the statement that "in the country the chances of seeing men fly have been few and far between, and but for the *Daily Mail* prizes there would probably be no chance at all," it was pleasing to find that your correspondent puts the latter part of this statement in italics, as it was true to the letter.

I am one of those (like thousands of others in Devon and Cornwall), whose "heathen ignorance" *has* been enlightened by the enterprise of the *Daily Mail*, and I am sure that had your correspondent been amongst the crowd at Barnstaple, Bideford, Westward Ho! and had heard some of the compliments paid to the *Daily Mail* and Monsieur Salmet, I fancy he would not have been quite so sarcastic about the "generosity of the *Daily Mail* and about that nice little man, M. Salmet." I fail to see anything degrading in being a little man, and I do not suppose M. Salmet has any wish to be a six-footer. Further, as a general rule, one finds that the little man can take the wind out of the sails of the big man.

Your correspondent, taking exception to the word "airman," seems to me to be either idiotic pride or childishness. I, like thousands of others, would only be too glad to be able to tack that "horrible" label on my name, or were I a motor driver I would infinitely prefer being called a driver, rather than a "chayfer," "shoffer," or any other murderous attack on the word "chauffeur."

I take it that it was the object of the *Daily Mail* that M. Salmet should reach the small towns and even villages in districts where aeroplanes had never before penetrated, and I fail to see how M. Salmet could manage this without touching other towns where an aeroplane might perchance have put in appearance once or twice.

The towns your correspondent mentions I know fairly well, and I am quite sure that when M. Salmet reaches either of the towns mentioned he will be received with as much enthusiasm as was evinced by the inhabitants of the outlying districts of Devon and Cornwall, and who in all probability will not have the pleasure of hearing the "whirr of a Gnôme," or any other engine and propeller for years, unless some one like your correspondent gives us a look up on an "all British" machine, and try and take the "shine" out of the pioneer endeavours of the *Daily Mail*.

I can safely say that he will get an excellent reception, and I should be most pleased to present him with an atlas in which he would find a shire called Gloucester, and what is more particular still, in that shire he will find a place called Filton. He might then apologise to the staff of the *Daily Mail* for his remark ("did any of the *D.M.* staff ever hear of such a place as Filton?").

In all probability the *Daily Mail* gave an unprejudiced account of Mr. Hucks with his Blackburn monoplane, and no doubt that Filton was mentioned.

In shouting down all things foreign your correspondent seems to forget the excellent relationship and good feeling that exists between the English and French, and since he seems to want everything all British, perhaps the old British adage, "Mewn undeb y mae nerth Parhäed brawdgarwch," might assist him in clearing some of the dust of prejudice from his eyes.

North Devon. A WOULD-BE AIRMAN.

[It takes all sorts to make a world. If our North Devon friend is a farmer he doubtless feels pleased that the bulk of the beef, mutton, butter, bacon, corn, poultry and eggs consumed in this country come from abroad, with the result that thousands of our finest young blood have to go abroad to make a living, and the poor British farmer cries because he cannot pay a decent rent if he has to pay his labourers a living wage, and insure them as well. Similarly our aeroplane makers object that too much foreign stuff comes into this country, thanks to the assistance of wealthy people and firms who *could* buy British stuff and give employment to British workmen and pilots if they wished. Perhaps he had not looked at it that way. M. Salmet and his Blériot are splendid—no one denies that—but a British paper, whose fortune has been made out of British halfpence, might have employed a British pilot and a British machine.—ED.]

Aeroplane Competitions.

Sir,—P. B. M.'s letter, under the above heading, prompts me to suggest an addition to his ideas on the subject.

My *modus operandi* would be to have several white sheets on which would be the name of a place a distance away, such as Chertsey, Boxhill, Windsor or Farnborough.

One of these sheets would be unfurled when all competitors

were in the air, when they would immediately start for the place shown on the sheet. What nicer than this "musical chairs" in the air? At least it suggests it.

Pilots would have to have a good knowledge of the surrounding country, and pylon "shaving" could be prevented by exposing the name at the bottom of a large box, the sides of which lean outwards, so that the name could only be seen at a high altitude.

Re "Tradesman's" letter concerning the British workman, I cordially agree with your comments in the foot-note. I have worked with both British and French mechanics, and, though a patriot, I would prefer one Frenchman to any two Britishers for intelligence and skill.

Does "Tradesman" know that several motor-car manufacturers purposely employ foreigners in England? Does he know that our swords and bayonets are tempered by foreigners, and that most of our razors are tempered and ground in Germany, and that there are or were foreigners in our dockyards?

The British workman is honest and second to none as a piece-worker, but his brains are his own, and he argues what is his isn't yours, so leave them alone.

Dulwich. D. G. P.

Sir,—In your article on the danger of pylon racing, etc., in a recent Aeroplane, you asked if any reader had an idea to give. I do not presume that my suggestion is at all practicable.

I propose that one pylon should be placed on the border of the aerodrome and that the competitors should start from the usual line, go round the pylon and keep outside the aerodrome for the specified number of laps. Observers could be placed along the borders of the aerodrome to see that the competitors do not cross the edge of the aerodrome until they have finished the specified number of laps.

Having completed their circuits, they can enter the aerodrome, again rounding the same pylon as before back to the starting line.

I may add that in handicapping, aviators might be handicapped not only by time, but also by the height at which they may fly.

Ware. Francis J. Dillon.

[If competitions were held just outside the edge of aerodromes, what inducement would there be for most people to come inside? Also, one pylon could be shaved just as closely and as dangerously as six. And the danger of flying low over the fences, trees, and walls round an aerodrome would be worse than flying inside over good ground.—Ed.]

Engine in Front versus Engine Behind.

Sir,—I have recently noticed that some correspondents still advocate the dangerous engine-behind aeroplanes; they point out that very few of the fatal accidents on this type of machine have been caused by the engine being dismantled and crashing into the pilot or passenger.

It seems only too obvious, and it requires very little common sense to convince one, that their chances of escape in the event of a bad smash is far less if they are sitting in front of the mass instead of behind, and experience has certainly proved the Avro type of biplane to be far safer than the engine-behind type.

A. V. Roe.

Next Week at Hendon.

For next Saturday at the London Aerodrome the programme includes the usual cross-country handicap and a speed handicap round the pylones. Fresh interesting machines are arriving at Hendon every week. Mr. Harold Barlow's new Blériot, piloted by Mr. Hucks, is one of the latest attractions, and it is understood that sheds have been taken by the Bréguet firm and by the Bristol Company, which indicates that machines of both these makes will be seen in competition ere long. One of the best British cross-country fliers has been engaged by the Bréguet people to fly their machines in the military trials, and probably some big cross-country performances will be done by him before the trials commence. Mr. Grahame-White has several new machines, including a monoplane of novel type, coming through his works, and some new machines coming from France also.

Aeroplane Handicap at Brooklands.

A handicap race will be run on Saturday, July 13th, the entrant of the winner to receive 50 sovs. or cup, at option; the entrant of the second to receive 20 sovs. or cup, at option; and the entrant of the third to receive 10 sovs. or cup, at option. An out-and-home cross-country handicap race, for all classes of aeroplanes. Distance about 10 miles. To close July 6th, 1912, at noon. Entrance: 1 sov., p.p. Ten entries, or the race may be void at the option of the executive; or, if not void, the number and value of the prizes may be reduced.—F. Lindsay Lloyd (Clerk of the Course).

The Royal Aero Club.

The following aviators' certificates were granted:—(232) Staff-Sergeant Richard H. V. Wilson, R.E. (Bristol biplane, Salisbury); (233) Lieut. Desmond L. Arthur (Bristol monoplane, Brooklands); (234) Lieut. Ercole Ercole (Bristol biplane, Salisbury) (subject to permission of Aero Club of Italy); (235) Paul Dubois (Deperdussin monoplane, Hendon) (subject to permission of Aero Club of France); (236) Capt. John H. W. Becke (Bristol biplane, Brooklands); (237) Norman S. Roupell (Howard Wright biplane, Hendon); (238) Edward H. Morriss (Howard Wright biplane, Hendon); (239) Capt. A. D. Carden, R.E. (Dunne biplane, Eastchurch).

Mr. Moorhouse's Wedding.

Mr. W. B. R. Moorhouse elected to be married on Tuesday last, just when The Aeroplane was going to press, which was inconsiderate of him. *Per contra*, by way of retaliation, the wedding must be chronicled as the last, though by no means the least interesting of the events noted in these pages. The wedding took place at St. Paul's, Knightsbridge. The service, though fully choral, was taken so slowly that it became positively depressing, and one felt quite sorry for the leading characters; in fact, a certain famous actor whispered to the writer that it would "go better if it played closer." Incidentally, a piano organ playing rag-time in the next street did not add to the solemnity of the proceedings. However, the bride and bridegroom did not seem to suffer, for they looked so radiant as they came out that one quite forgot to look at their clothes for descriptive purposes. True to his sporting instincts, Mr. Moorhouse carried his bride off in his big blue Rolls-Royce, with the faithful Tookey beaming like a head-light behind. The reception at the bride's mother's house was quite a charming function. Several aviators were present—namely, Messrs. Sopwith, Hamel, Loraine, and Abercrombie—as well as Colonel Trollope and Messrs. Dela-Combe and Cary, of those well known as interested in aeronautics. Mr. and Mrs. Moorhouse left in their Rolls-Royce, with the well-known Moorhouse salute, produced by exploding the contents of several cylinders in the exhaust-box. They go to France for their honeymoon, and will quite likely do some flying together there.

One has certainly never seen a more charming bride, and seldom a more cheery bridegroom, and one can only wish heartily that their married life may continue as happily as it has begun, so that we may all celebrate their silver and golden weddings in as cheerful a way.

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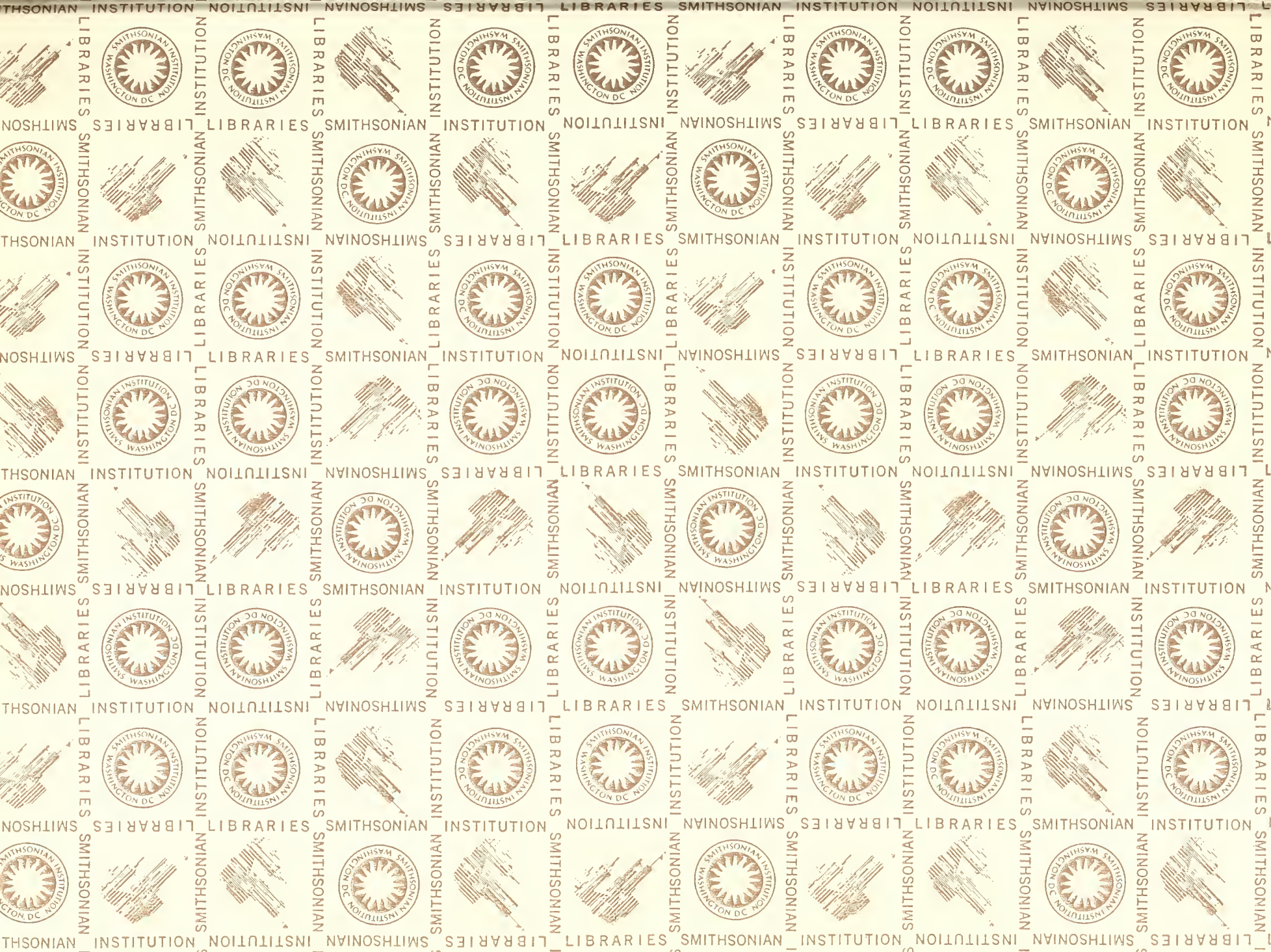
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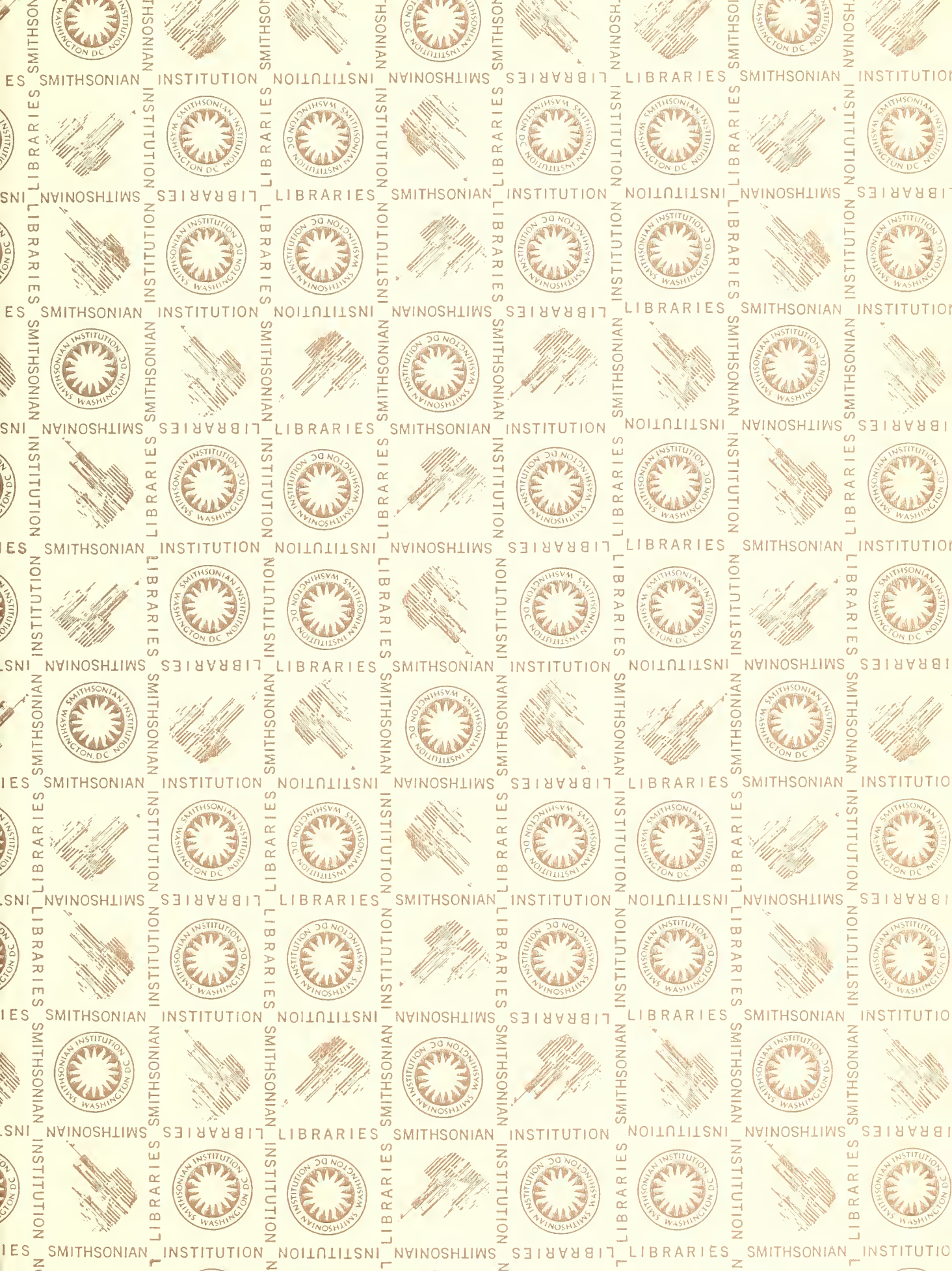
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